

The American Journal of Pharmaceutical Education

THE OFFICIAL PUBLICATION OF THE AMERICAN
ASSOCIATION OF COLLEGES OF PHARMACY.

Volume II

April, 1938

Number 2

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Some of the pharmaceutical journals have refused to accept such questionable advertising which seeks to mislead the reader and their action is most commendable. One of the operators of such a school is now engaging in a direct-mail campaign. Several of the boards of pharmacy have served "cease and desist" orders to this operator in view of the misleading statements that are being made and have threatened to take action unless the misleading advertising is stopped.

Quiz and review schools are largely responsible for the erroneous impression which exists among drug clerks that once they receive a license in one state, it is an easy matter to get reciprocal registration in other states. **THIS IS ABSOLUTELY FALSE.** A non-graduate who passes the board examination in one of the three states still without any provision for recognized training will **not** be eligible, on such license, in any state now requiring college. Thus he finds his scope of reciprocal possibilities limited to the other two non-college states. These states are naturally overcrowded and have considerable unemployment because of the constant large classes supplied by the quiz schools even though the passing percentage is low. How much does such a license mean to you? Very little, if you have no opportunity to use it. But to the school it does mean a fee for the course whether you pass the board or not and that is why high pressure promotion is used.

As secretary of the National Association of Boards of Pharmacy which is the central clearing house for reciprocity, I have the sad and painful duty of telling those who have taken such courses and passed one of these board examinations that they are not eligible for reciprocal registration back home where graduation from a **recognized** college of pharmacy is usually required. I naturally feel sorry for these lads who have spent considerable money that they can ill afford in following a vain delusion but I cannot help them. That is why I am giving out this information now. If you are not eligible to sit in the board examination in your own state at present, then you will not be eligible later by reciprocity on the license of another state. Do not waste time and money. The same standards are enforced in reciprocity as in examination.

STOP, LOOK and LISTEN whenever a quiz school tries to separate you from your money. Always demand of the school a **written** statement regarding its standing, and demand to know whether its graduates are eligible for examination in the several states. Remember, if the school will not give you this information, the National Association of Boards of Pharmacy will.

H. C. CHRISTENSEN, Secretary,

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THE AMERICAN JOURNAL

- - OF - -

PHARMACEUTICAL EDUCATION

Volume II

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Published quarterly by the American Association of Colleges of Pharmacy at Lincoln, Nebraska. (Clafin Printing Company). Subscription price \$2.00. Foreign \$2.50. Single copies 50 cents. Entered as second class matter July 1, 1937 at the postoffice at Lincoln, Nebraska under the Act of August 24, 1912.
Editorial Office: College of Pharmacy, University of Nebraska, Lincoln, Nebraska.
Address all communications to the Editor.

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Survey of Regulations and Educational Requirements of Pharmacy in Certain Foreign Countries*

ERNST T. STUHR

Oregon State College School of Pharmacy

In the past it has been mainly a matter of conjecture as to the regulations and educational requirements of pharmacy in countries other than the United States. We have heard from various sources that one country has a longer period of apprenticeship than that required in the United States, or that another has five years of formal education instead of four, and similar comparisons.

Feeling that a study of these and related factors in other countries might produce worthwhile ideas for improvement of our own standards, the author has attempted to make such a study, the results of which are set forth in this article.

Several sources were utilized in collecting data: questionnaires sent to schools of pharmacy in foreign countries, catalogs of the schools, foreign pharmaceutical associations or societies, magazine articles on pharmacy in other countries, and consultation with those who have had first hand experience in foreign fields. In the latter classification, the author is especially indebted to Dr. Harald Holck of the University of Nebraska for his contributions on the Scandinavian countries, Holland, Asia Minor and Egypt.

The following types of information were sought:

1. Laws governing the practice of pharmacy.
2. Laws governing the education and licensing of a pharmacist.
3. Regulations concerning apprenticeship.
4. Educational requirements from a curricular standpoint.
5. Recognition of pharmacy.
6. Attitude toward women as pharmacists.

The countries from which information was obtained are Canada, England, Norway, Denmark, Sweden, Austria, France, Germany, Holland, Italy, Egypt, Palestine, Lebanon, Iraq and Syria.

*A study project of the Problems and Plans Committee.

It is interesting to note that all of the countries have some type of government control for practice of pharmacy, in most cases by the national government, the exception being Canada and Germany which have provincial control. The educational requirements are controlled in most cases by governmental agencies and school boards, all countries requiring some type of formal pharmaceutical education. Apprenticeship is required in all countries, the length of time varying from six months in Egypt and Syria to three years in Germany. In some instances apprenticeship must be taken prior to college work, some during, some after formal education has been completed, or a combination of these. Most of the candidates start their formal pharmaceutical training at about eighteen years of age; in the countries having a pre-apprenticeship, the students are correspondingly older. In Germany and Sweden students enter upon formal education at about 22 years of age. A pharmacist must have a license to practice in all countries except in France, where a diploma only is necessary. In Denmark graduation from a school of pharmacy and ownership of a drug store is necessary.

All of the countries admit women to practice under the same conditions as men. The profession is rated generally very high in most of the European countries; in Asia Minor and Egypt, however, it is considered less than medicine but probably more than dentistry. In Iraq it is less than either, as the pharmacist is considered the servant of the doctor.

The outstanding features of the various countries are as follows:

AUSTRIA*

Laws governing pharmacy in Austria are made and enforced by the government. The five main statutes cover equipment and management of the pharmacy, salary of employees, practical training of an apprentice, contact of the pharmacist with his customers, and the curriculum of pharmaceutical universities.

The length of the curriculum is three years, the completion of which entitles the candidate to the degree of Master

*Information from article by Richard Kurtics, Director of the Austrian National Pharmaceutical Association, in "Druggist Circular", May, 1937.

of Pharmacy. Upon completing two more years of study and the delivery of a dissertation, the candidate is awarded the degree of Doctor of Pharmacy. After the three years of formal training the student is classed as an "aspirant" and must serve as an apprentice for two years. At the end of the two years he may take his oral and practical examinations. The examinations cover prescription examining and filling, the identification and analysis of drug materials, the manner of contacting customers, pharmacy bookkeeping, business correspondence, mathematics, the pharmacopœia, the use of standard pharmaceutical references, the purchasing of pharmaceuticals, and a knowledge of their geographical source, and the laws governing pharmacy. If the candidate is successful in passing the examination he is rated as a first class pharmacist.

After a first class pharmacist has worked at his profession for fifteen years he may apply for an apothecary's license to operate a store.

Another outstanding feature of the Austrian system is the pension plan. As has been said before, the salaries are governed by law. This law provides for a cooperative pension fund contributed to equally by employer and employee, the amount depending on length of service and number of dependents. This fund has several security features in addition to its old age security, e.g. sickness indemnity, arrangement for a substitute pharmacist for relief in illness, arrangement for a substitute for a country pharmacist during vacation periods (in return for a small regular payment), employment bureau, intermediary in rent and sale of apothecaries, and a form of credit.

CANADA

The laws governing pharmacy were established by acts of provincial legislative assemblies. They are enforced by the provincial pharmaceutical association or society incorporated by the provincial act.

Pharmacy schools are regulated by the respective colleges or universities jointly with the pharmaceutical societies.

The practice of pharmacy is controlled by provincial boards and pharmaceutical associations with authority delegated by the legislative assembly. The appointments to controlling commissions are made usually by the council of the

respective pharmaceutical associations. In Nova Scotia appointments are made jointly by the government and the association.

In Canada a pharmacist must have a license to practice and must renew it annually. He must have completed formal pharmaceutical education except in the provinces of Prince Edward Island, New Brunswick, and British Columbia. He must also have served an apprenticeship. In most provinces this is served for three or four years before entering a college, depending on the province. In Quebec, the student must serve a four-year apprenticeship simultaneously with his college course.

After two years of formal education the student is granted a diploma in pharmacy. If he takes the three or four year course (depending on the province) he is granted the degree of Bachelor of Science in Pharmacy.

As to the question of whether or not a graduate must pass an examination before being licensed, the answer differs according to the province. Saskatchewan graduates are admitted to membership in the pharmaceutical association and can practice without further examination. In Nova Scotia graduates must take an examination. In Manitoba a diploma is sufficient for registration. In Quebec an examination is required of all candidates. The subjects covered in the examination are pharmacy, pharmaceutical chemistry, prescriptions and dispensing and pharmacognosy.

DENMARK

The laws regulating the practice of pharmacy in Denmark are established and enforced by the state. There is inspection by the state inspectors and the state takes prompt measures to correct any irregularities. Every pharmacy is inspected at least once a year by the district physician and one "visitor" with pharmaceutical training—both being appointed by the state.

The practice of pharmacy is under the control of the state sanitary board together with the physicians. This board is under the minister of the interior. Appointments to the board are made by the state.

In Denmark ownership of a pharmacy is the only "license" needed but the pharmacist must have had a formal education. After two years of general college, the student

must work for two and one-half years as an apprentice, working eight hours a day. This leads to the rank of pharmaceutical assistant and precedes training at the college of pharmacy. He must take an examination before entering upon his college work. He then goes to the college of pharmacy for two years receiving at the end of this time the degree or title of "pharmaceutical candidate" if he passes the examination successfully. Students are admitted to school in Copenhagen only every two years. He must go an additional half year if he wishes to teach.

The respect for pharmacy is very high and is on a par with medicine. Pharmacists are often relatively wealthy due to the fact that there are only 340 pharmacies for a population of 3.5 million people.

Denmark has a pension system. Druggists must pay into the pension fund an amount in accordance with their net income. The druggists, their wives and dependent children benefit under this system.

EGYPT

Laws are established and enforced by the Egyptian parliament subject to the approval of the King. The only university, which is located at Cairo, is a government university, hence its standards are set by the government.

A pharmacist must have a license, he must have had a formal pharmaceutical education and he must have served an apprenticeship. The apprenticeship period is relatively short, only six months, and may be served at any time, usually during the summer vacations. Graduation is necessary before being licensed. The graduate must also take an examination in all pharmacy subjects, the examination period lasting from nine to twenty days. The pharmacy course is three years in length, the completion of which entitles the student to a Bachelor of Pharmacy degree.

A unique feature of Kasr-el-Aini University at Cairo is its method of determining eligible students. If a student has sufficiently high grades in his preliminary schooling, that is, in his so-called "baccalaureate examination", he may enter the university, his choice of medicine, dentistry, or pharmacy, depending on his grade. The students who have the seventy highest grades have complete freedom of choice, most of them entering medicine; the next forty may enter

dentistry or pharmacy but not medicine; the next forty may enter pharmacy but neither dentistry nor medicine. Students ranking below these first one hundred and fifty may apply for the other courses in the University. There are, in addition, some interesting exceptions. Four sons of doctors may be added to the first group of seventy for medical education even though their grades are lower; two dentists' sons may be added to the next group of forty; two pharmacists' sons to the pharmacy group of forty.

ENGLAND

The laws are established and enforced by the government in accordance with the Pharmacy Acts. The practice of pharmacy is controlled by the Pharmaceutical Society of Great Britain in accordance with these acts. The schools of pharmacy are standardized by the Pharmaceutical Society.

A pharmacist must have a license, and he must have had some formal pharmaceutical education. He need not be a graduate, but he must pass an examination. He must be at least twenty-one years of age before taking the examination.

England has three grades of qualifying examinations—druggist, chemist and pharmaceutical chemist, pharmaceutical chemist having the highest rating. The candidate for a license is examined in pharmaceutical chemistry, pharmacy, pharmacognosy, pharmaceuticals, physiology, and forensic pharmacy. If a candidate holds a degree in pharmacy he is excused from all of the examinations except that of forensic pharmacy. Before being registered he must also have served 4,000 hours as an apprentice.

The approximate length of the pharmacy curriculum leading to a degree in pharmacy is five years, including apprenticeship.

There are only three universities in England which offer courses in pharmacy, but there are numerous institutions in which a student may prepare to take the pharmacy examinations.

Pharmacists may qualify for government positions in the navy and in colonial service, the latter consisting mainly of teaching or of supervision of the cultivation of medicinal plants.

FRANCE

Pharmacy in France is governed according to the phar-

macy law of 1898 and is controlled by government inspectors. The standardization of schools is under the minister of education. Appointments to the controlling commissions are made by the minister of education, the members appointed to the examining board being professors of pharmacy schools.

A pharmacist must have a license which may be obtained upon graduation from a pharmacy school. He need not take an additional examination. Before entering the college he must have served one year as an apprentice, at the end of which he must have passed an examination. The curriculum is five years in length, leading to a diploma of "Pharmacien". A pharmacist is highly esteemed, being on a par with the doctor and dentist. Pharmacists who have graduated from the regular course do not qualify for government positions as there are special schools for military or naval pharmacists.

GERMANY

The pharmacy laws of Germany are established and enforced by the government. It is controlled by the government but all traffic in pharmaceuticals is controlled by the province physician. Standardization of schools is under the Department of the Interior.

A pharmacist must have a license to practice. He must serve as an interne for one year after graduation before being fully registered. He must have had a formal pharmaceutical education and must have served as an apprentice for two years in a recognized "instruction pharmacy" before entering the pharmacy school.

The pharmacy course is three years in length, after which he serves as an assistant or interne.

A pharmacist may qualify for government positions but must take additional educational work, especially in food chemistry, in order to do so. Pharmacy as a profession is rated very high.

HOLLAND

Pharmacy in Holland has been controlled by national law since 1865. It is enforced by inspection by officials of the board of health. The board consists of professors and lecturers of the University. The examining board consists of this same group plus some practical pharmacists. School standards are regulated to a certain extent by the govern-

ment, but the school of pharmacy is part of the University and is under the faculty of science.

A pharmacist need have no license but he must have graduated from the University and have passed the examinations consisting of pharmacy, chemistry, toxicology, pharmacognosy, pharmacology and analytical chemistry.

The college curriculum consists of six years: three years of fundamental work, e.g., physics, chemistry, botany, and three more years for his doctorate at the end of which he may take his practical examinations. He is then classed as an "apotheker". After writing a thesis he can become a doctor of science. During his school years and holidays he must have served for twelve months as an apprentice.

A pharmacist in Holland may qualify for government positions, obtaining a rank of first lieutenant to colonel. He is head of the hospital. Pharmacy is rated on a par with medicine, pharmacists being included among the better situated citizens.

IRAQ

Pharmacy in Iraq is controlled by the government on the initiative of the Health Department which is under the Minister of the Interior. Its regulations must have the sanction of the parliament and the approval of the King. Enforcement is by the inspectors of the Health Department.

A pharmacist must have had a formal pharmaceutical education (since 1932); he must have a license but need not pass an additional examination. There is only one school, the Royal College of Pharmacy at Bagdad, which has a four year course leading to a degree of Pharmaceutical Chemist. The prospective pharmacist must serve apprenticeship during three summer vacations in a pharmacy or a government hospital pharmacy.

A pharmacist may qualify for a government position. He has the rank of lieutenant in the army and complete charge of pharmaceutical work.

Pharmacy as a profession is rated lower than medicine or dentistry as the pharmacist is considered the servant of the doctor.

ITALY

Pharmacy laws in Italy are established by the national

government and enforced by a commission. All pharmacy schools are part of universities.

All aspirants to the practice of the professions must be university graduates, and must qualify for their respective professional examining commissions by first passing the examinations of a special governmental commission. The members of the pharmaceutical commission are appointed by the National Minister of Education with the approval of the King. This commission is composed of certain members of the pharmacy faculties and usually several recognized pharmaceutical practitioners. The commission is presided over by a governmental official outside of the profession.

The commission's qualifying pharmacists' examination consists of the following:

I. Practical:

1. Qualitative analysis of a mixture of salts (at least two metals and two acids).
2. Identification of, and detection of impurities in two drugs.
3. Preparation of one galenical, and filling of one prescription. (Above must be finished in eight hours.)

II. Oral (30 minutes):

Pharmaceutical chemistry, toxicology and pharmaceutical technique.

In addition to a formal pharmaceutical education a pharmacist must have a license to practice. The license must be renewed every five years. During the four years of professional schooling in a royal university a twelve months' apprenticeship must be served.

JAPAN

Japan was originally included in the study. In that country there are seven government and four private schools. No replies were received.

LATIN AMERICA

An attempt was made to include in the study the schools in Latin America. Questionnaires were addressed to 5 schools in the Argentines, 1 in Bolivia, 26 in Brazil, 3 in Colombia, 1 in Costa Rica and 1 in Cuba. The only replies were 2 from Brazil.

LEBANON

Pharmacy in Lebanon is under the control of the government, specifically the department of health. The laws are

enforced by inspectors; the schools are standardized by the school boards.

There are two schools of pharmacy in Lebanon: the French University and the American University of Beirut. Graduates of the French school need no further examination; any others must pass an examination given by the high commission. Each of the schools has a four year course. A graduate of the French school is called a first class "pharmacien"; a graduate of American University of Beirut being a pharmaceutical chemist.

A pharmacist must have a license. He must also have served an apprenticeship of twelve months before entering the French University; if he enters the American University of Beirut he has the choice of serving his apprenticeship before or after the school period. If before, he must serve twenty-four months; if after, he need serve only twelve months.

Pharmacy is rated as lower than medicine but probably higher than dentistry.

NORWAY

Pharmacy in Norway is governed by the law of 1907 and supplementary laws. It is under the control of the Department of Social Affairs. The school curricula are determined by the church and school departments. A pharmacist must have a license. He must have graduated from a school of pharmacy and must have passed an additional examination.

The length of the pharmacy course is four and one-half years leading to the degree of "Candidatus pharmaciæ". After eighteen months of study at the university he must serve an apprenticeship of eighteen months and then complete his schooling.

The standing of a pharmacist is generally very good.

PALESTINE

Palestine has no school of pharmacy but admits graduates of foreign schools to the practice of pharmacy. Those applying for practice who are not graduates must take an examination given by the High Commissioner.

The practice of pharmacy is controlled by the government, specifically by the Public Health Department under the authority of the High Commissioner.

The standing of pharmacy is lower than that of medicine but probably higher than dentistry.

RUSSIA

Due to certain communistic regulations and practices no attempt was made to canvass Russia in this survey. "Socialized Medicine in the Soviet Union" by Henry E. Sigerist, Professor of History of Medicine, John Hopkins University, recently published by Victor Gollancz, Limited, London. 1937, gives an account of the conditions of pharmacy in Russia. The main features are printed in the January 29, 1938 number of the British Pharmaceutical Journal, page 104, and are as follows. 1. Medical science is free and available to all. 2. Disease prevention is the chief function of all health activities. 3. All health activities are directed by the people's commissariats and therefore can be planned on a large scale. Individuals, both sexes, ages 17 to 35 years, and graduates of a 7 year school are eligible to admission to one of the 29 pharmaceutical "technicums" which give a 3 year course. Graduates from the "technicums" are permitted to serve as assistants in city or hospital pharmacies or are attached to small medical stations. In the training of higher personnel there are pharmaceutical institutes connected with medical schools of Leningrad, Tiflis, and Perm. There are also schools of pharmacy at Karkov, Kiev, and Dniepropetrovsk in the Ukraine, and in various other centers. For admission to these, graduation from a ten-grade school or from a pharmaceutical "technicum" is required. The curriculum of these schools include general biology, microbiology, human anatomy and physiology, higher mathematics, minerology, crystallography, physics, all branches of chemistry, pharmacology and pharmacy, history of pharmacy, experimental hygiene, social hygiene and vital statistics, military hygiene and chemical defense, organization of health protection, and a number of other subjects depending on the specialized work selected by the candidate. These schools train not only pharmacists, but persons taking up forensic use of chemistry, directors of the drug trade, research workers, and teachers in pharmacy.

SWEDEN

Pharmacy laws are established and enforced by the government. Pharmacy is controlled by inspections from the

medical department, usually by medical doctors authorized by the government. The school standards are established by the educational department.

A pharmacist must have a license and must have had a formal education. He must have served an apprenticeship of at least two years after he has taken his matriculation examination. He must have graduated from the prescribed course but need take no further examination. The pharmacy course consists of five and one-half years apportioned as follows: two years' apprenticeship; six months at Institute of Pharmacy; one year of practical service, then two more years at Institute of Pharmacy. He then is licensed as an apothecary. His standing is similar to that of dentistry.

SYRIA

Pharmacy in Syria is controlled by the government and enforced by inspection of the Board of Health. The school is regulated by the school board.

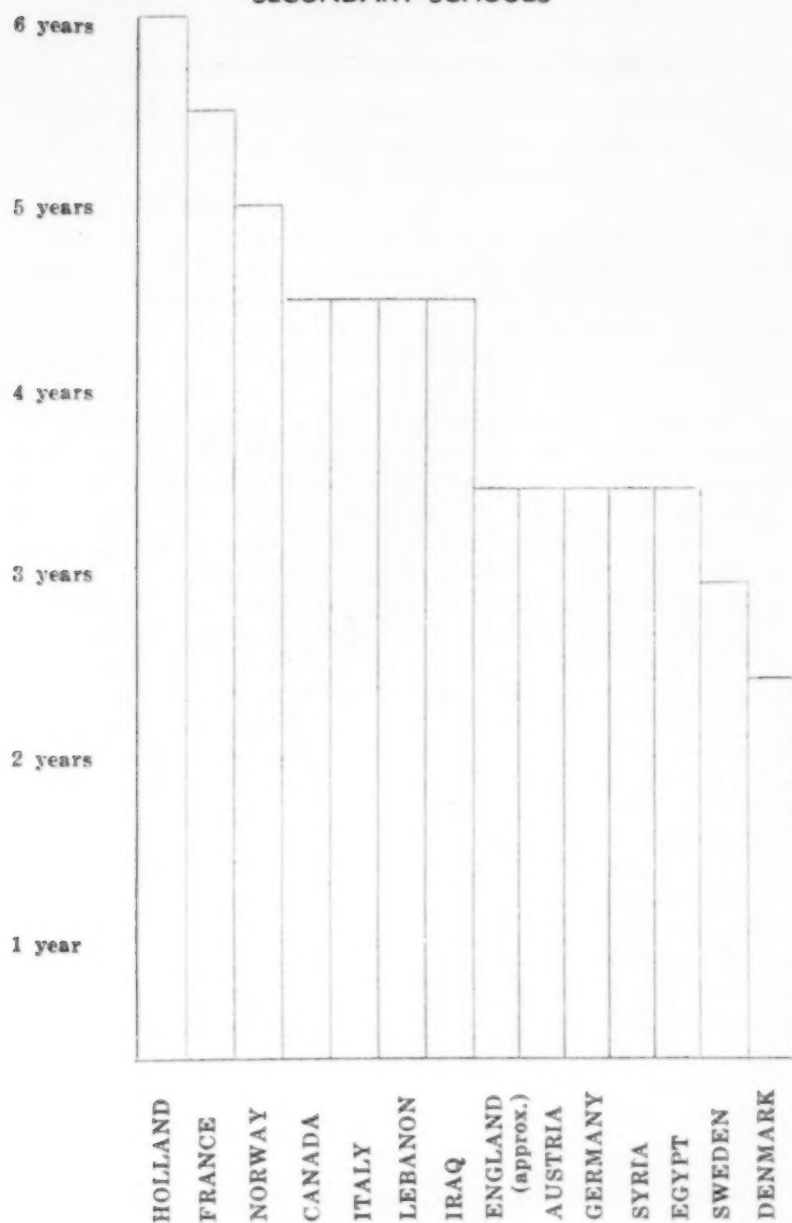
A pharmacist must have a license and must have had formal education. He must have served an apprenticeship of six months at any time before getting license.

Syria has one school of pharmacy included in the Syrian University at Damascus. It consists of a three year course leading to a pharmacy diploma.

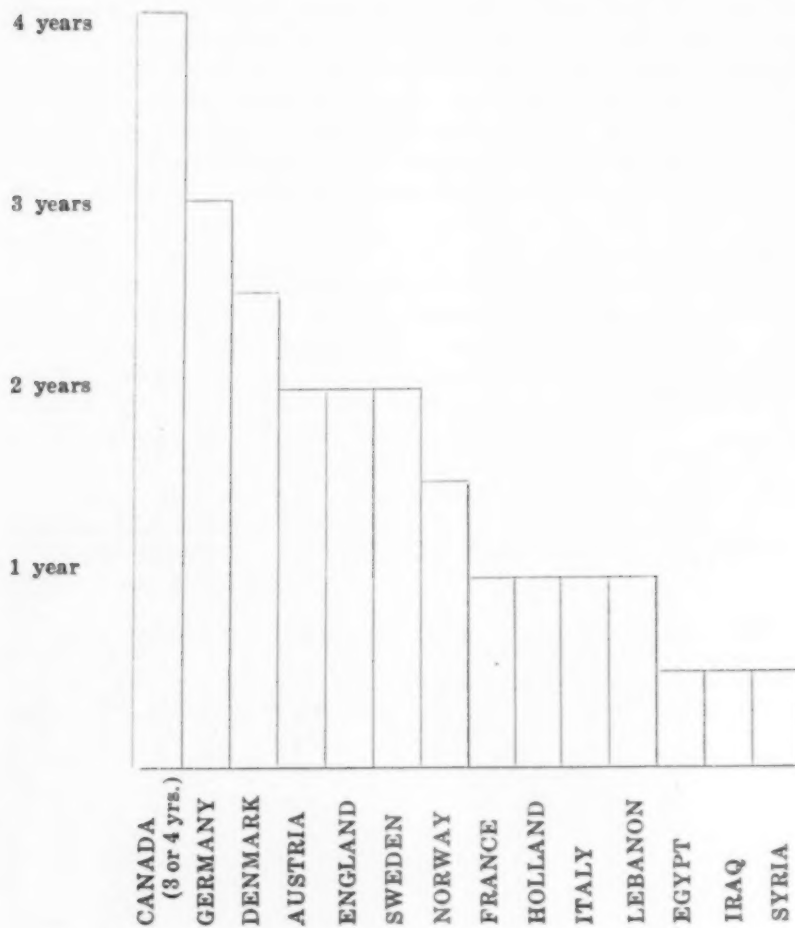
A pharmacist's standing is less than that of medicine but higher than dentistry.

In the graphic comparisons attached to this article Russia, Japan and Latin America are not included, either because of no replies or because of irregularities of requirements which made it difficult to reduce them to a uniform standard.

COMPARISON OF FORMAL EDUCATION BEYOND
SECONDARY SCHOOLS



COMPARISON OF APPRENTICESHIP PERIODS



Basic Training in Galenical Pharmacy*

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The subject I wish to discuss today: The Importance of and the Methods of Teaching Galenical Pharmacy, has in the course of the last few years grown into a question of international significance.

The conditions under which practical pharmacy is operating differ so widely in the various countries that the question might be raised whether such training can be of universal interest, but before entering upon this question, I wish to call attention to the great difference between practical and galenical pharmacy.

Practical pharmacy is being taught in many schools of pharmacy all over the world, but in my opinion practical pharmacy cannot be learned in school, but only in practice. It is, of course, possible to teach the student certain fundamental facts and certain dogmatic principles by an organized scheme of instruction, but the proper training in practical pharmacy must necessarily be acquired in an actual pharmacy either before or after the theoretical study. It is true, as I have said, that the conditions of practical pharmacy differ very much in the different countries, and that practical work must necessarily be influenced strongly by the special or, one might be tempted to say, national conditions of each country. But I believe, nevertheless, that a certain uniformity both in the methods of teaching as well as within the domain of practical pharmacy, will prove necessary in the near future,—a uniformity perhaps similar to that organized in Germany through the authorized "Lehrapotheke".

Galenical pharmacy, on the other hand, is internationally orientated, and the vivid interest which has been dedicated during the last ten years by many countries to galenical pharmacy, will prove of great importance to the future of our profession. This interest has made itself felt, quite independently of the conditions of practical pharmacy in the countries in question. (Switzerland, Norway, Germany, Denmark).

*Read at the General Assembly of the International Federation of Pharmacy at Copenhagen, August 28, 1937.

What, then, is galenical pharmacy? I shall undertake no historical account of the development of the subject, and I shall particularly leave *Galen* himself quite out of the discussion. I should define galenical pharmacy as the doctrine of the *preparation, stability and valuation* of the various forms and compositions of remedies. While chemistry, and pharmacognosy, each within its own scope, deal with the nature and composition of our raw materials, galenical pharmacy is the science which deals with the refinement of the raw materials, with their development into the finished remedies.

I shall take the liberty of illustrating by two examples the difference between the pharmaceutical *art* of the past, often designated as galenical pharmacy, and the present independent science of galenical pharmacy.

An extract of hyoscyamus has been much used in this country as an ingredient of a stomachic powder. The pharmaceutical *art* demanded that this extract should have a fine green color, so vivid as to impart to the finished powder, which contained only 3 per cent of the extract, a green tint. The original idea may have been that the green color afforded proof of the careful preparation of the powder. Gradually, however, this "coloristic" view of the matter came to predominate to such an extent that the fact that the value of the extract depended upon its content of active alkaloids, and not upon the indifferent coloring substance, chlorophyll, was forgotten. It is only through the researches of the last few decades that we have learned something about the behavior of the hyoscyamus alkaloids under conditions similar to those obtaining in the extract, of the alteration of hyoscyamine into atropine, and of the decomposition of the latter into the inactive substances tropine and tropic acid.

The application of these results of pharmaceutical chemistry now enables us to work out expedient methods for preparing this extract, and satisfactory methods for estimating the same. The preparation of this remedy has developed into a problem in modern galenical pharmacy, and the conscientious pharmacist may discover that his dream of a beautiful green remedy can satisfy only his eye, but not his pharmaceutical conscience.

Another example, "l'enfant terrible" of practical pharmacy for many years is the ergot preparations.

After having in the past prepared extract of ergot according to the conventional methods of practical pharmacy, certain methods were retained for a considerable number of years and considered suitable for the purpose; being based upon the tests of the clinical activities of the products. This method of test the value of a remedy, which might seem to be the best that could be obtained at that time, suffered however, as my hearers will know, from great uncertainty. It is not to be wondered at that the results, to the eyes of the practical pharmacist, were unsatisfactory.

With the increasing knowledge of the active principles of ergot, efforts were made to improve the methods of preparation, but it is only the immense progress of the last few years in our knowledge of the ergot alkaloids—just think of the fine achievements of our honored past, Professor Stoll—which created the foundation upon which galenical pharmacy may set to work in hope of really fruitful scientific results.

Let me mention in this connection, as objects of interest, two special preparations. In this country we have for many years used a thick ergot extract for making pills. In the light of the knowledge of the active principles of ergot which we possessed about five years ago, this extract, which was official in the Danish Pharmacopoeia 1907 (valid until 1933) must be regarded as practically worthless as a remedy. Elderly clinicians, however, kept on using it, and the discovery of ergometrine (ergonovine) about two years ago has now justified their faith in the good qualities of this preparation, hitherto so much disparaged by pharmacists. The honored President of our Federation would be able to supply a corresponding example from his own practice. I am thinking of the ergot ampuls of Vesterbros Apotek, which must undoubtedly be regarded as an empirically prepared ergometrine remedy, prepared at a time when ergometrine was absolutely unknown.

I hope I have been able, by means of these examples, to illustrate the fact that galenical pharmacy must be regarded as the scientific department of practical pharmacy, as its "clinical science", building a bridge between the fundamental sciences and the practical pharmacy of daily life.

It is only when the facts supplied by chemistry and pharmacognosy are applied to the preparation of our pharmaceu-

tical remedies, utilized for increasing the stability of these, and for working out reliable methods for estimating the value of the same, that we have mastered the science of galenical pharmacy. Then, and not until then, the merely empiric methods of the past, are supplanted by conscientious research, and the ancient "art" of our profession is elevated into the sphere of science.

Pharmaceutical training without instruction in galenical pharmacy is to be compared with the training of physicians exclusively in the theoretical subjects of anatomy, physiology, pharmacology, etc., leaving the student to apply these theoretical branches of science to his practical clinical work!

Under what forms may basic training in galenical pharmacy be practised? Should the instruction be theoretical or practical, or perhaps both?

Galenical pharmacy has been taught for many years as a university subject, for example, in France, but, in so far as I know, only upon a theoretical basis. In view of the somewhat declining position, held during the past few decades by the methods of galenical pharmacy in many countries, I shall not hesitate to say that I consider practical exercises in galenical pharmacy not only desirable, but absolutely necessary, if we desire our ancient profession to remain a progressive and productive profession, conscious of and capable of assuming its responsibilities.

Even here in our own country, where the conditions are of course best known to me, and where it can be asserted without exaggerating that productive galenical work is still being carried out in the individual pharmacies to such an extent as to place Denmark above most other countries in this respect, I must assert that instruction in galenical pharmacy is required, out of regard both to the professional attainments of the student and to the uniformity of his training. I am happy to have obtained acknowledgment of this view, not only from my colleagues, and from our professional organizations, but also, last but not least, from our legislative authorities.

The forms of instruction in galenical pharmacy must, of course, differ considerably in the different countries, but I think it will gradually be acknowledged as an international principle that the teaching must include theoretical instruction and practical exercises.

The theoretical aspects of the subject will consist of the examination of the remedies used in the country in question. The preparation, stability and evaluation of the same will be illustrated and commented upon, criticized if necessary, all with reference to the acknowledged results of the natural sciences, particularly of chemistry and pharmacognosy, of the day.

With regard to the practical exercises, I hope to have pointed out already the great difference existing, in my opinion, between galenical and practical pharmacy, a difference which must of course be reflected in the teaching. The chief point is not, consequently, to impart to the student practical skill and training in the execution of certain operations. It is rather to open his eyes to the intimate connection existing between his theoretical knowledge and the practical execution of his profession by having him examine thoroughly a carefully selected number of practical operations,—the foundation upon which he is to build his future.

I should like to illustrate this point of view by a few examples selected from my own course of instruction, and I wish to say at the same time that I do not regard these as being of international application, since they are closely adapted to our own national Danish conditions, and also, alas, to the very meager time allowed by our teaching plan for practical exercises.

My first example is the preparation of extracts, and the exercises comprise the preparation of malt extract and an extraction of *nux vomica*. Extract of malt was chosen, not on account of its pharmaceutical importance, but because malt is a cheap, and as we shall see, not uninstructional raw material. The student grinds 5 kilograms of malt, thereby getting an opportunity of operating an electrically driven drug mill. (Excelsior Mill.) Next the ground malt is extracted twice, by infusing with water at 65°C., and the infusion is kept until next day.

The student now experiences some enlightening difficulties in clearing the extract, and if he works too slowly, he runs the risk, also instructive, that the extract becomes acid, which he ascertains by a pH measurement. The infusion is now divided into two parts, one of which is evaporated in the ordinary evaporating dish, and the other in a vacuum still, at a temperature not exceeding 60° C. In both cases he

obtains a thick extract. The two extracts are now compared. Taste and odor do not differ appreciably, although the extract evaporated in the ordinary dish has more of a burnt taste, and is somewhat darker than the extract evaporated in the vacuum still. The student now undertakes a determination of the respective diastatic activities of the two extracts, by determining the quantity of starch which will be decomposed by one part of the extract to the point where no reaction is given with iodine. He finds out in this way that the extract concentrated *in vacuo* possesses strong diastatic activity, while in the extract concentrated at ordinary atmospheric pressure this activity has practically disappeared.

Having carried out this primitive exercise, the student has obtained a practical proof of the importance of evaporating extracts *in vacuo*, and he learns that vacuum evaporation is a more gentle procedure than evaporation in the ordinary dish. And when he is told in a theoretical lesson, that the eminent British pharmacist, John T. Barry, in a paper "On a new Method of Preparing Pharmaceutical Extracts", read before the Medical Society of London on May 25, 1819, described a method for concentrating infusions *in vacuo* and recommended this method, advancing the argument that it gives much stronger extracts, thus, for example, rhubarb extract, evaporated *in vacuo* grows twice as strong as ordinary rhubarb extract, the student nods recognizingly. He has acquired in practice the same knowledge, and even in a more quantitative way than did Barry.

The extraction of *nux vomica* is carried out as fractional percolation, one part of the drug plant being percolated with 60 per cent alcohol the other with the same, with the addition of acetic acid. In each case five fractions are collected, amounting to a total of five times the weight of the drug. The student then determines the amount of extractive and alkaloidal content for each of the ten percolates, and records the results graphically. Ordinarily the student will obtain a fine regular curve, generally typical of the extraction of alkaloidal drugs, and therefore eminently instructive.

Quite apart from the educational value of this exercise, in so far as galenical pharmacy is concerned, it has proved to have a certain importance in the general training of our students. Their determinations of alkaloids in drugs and remedies, which formerly caused some difficulties, are now

almost always correct, and there is no doubt that this is to be ascribed to the experience gained by the student in carrying out the ten uniform determinations required in this exercise.

I shall now briefly mention an exercise dealing with the preparation of parenteral solutions. The student first prepares an isotonic solution of arsenic trioxide, containing 1 mg. of As_2O_3 per cc., and having a pH of 7.4. The student then determines the content of As_2O_3 and the hydrogen ion concentration, and, by means of a determination of the freezing point of the solution, ascertains whether the solution is actually isotonic. The student not only acquires in this way knowledge of the methods used in carrying out such operations, but the application of the methods to the control of the finished product gives him an impression of the efficiency of the methods which is not easily forgotten.

The next part of the exercise deals with the preparation of solutions containing procaine. The student prepares solutions, partly in water, partly in buffer solution (phosphate buffer $\text{pH} = 6.5$). The solutions are transferred to ampuls, some of which are of Jena and others of Thüringer glass. After sealing, the ampuls are subjected to heat sterilization, one portion at 100°C . and the other in the autoclave at 120°C . After this treatment, the contents of the ampuls are examined and determinations are made of the pH value, the procaine content, and the hydrolytic decomposition, if any, of the procaine. This exercise has been so arranged as to give considerable variation of the pH value in the purely aqueous solutions, sterilized in Thüringer glass, while the solutions in Jena glass are only slightly altered, and in both cases the hydrolysis of procaine is negligible. The case is quite different with the buffered solutions, showing in all cases only slight alterations of pH , but also in all cases decided hydrolytic decomposition of procaine, most in the autoclaved solutions, less in those sterilized at 100° . Summing up the results of this exercise, the student has learned the importance of the quality of ampul glass, the hazard attached to the addition of buffer to the solution containing alkaloids capable of being hydrolyzed, and all of this has been demonstrated so perspicuously as to facilitate considerably the theoretical instruction.

Out of regard for the value of the time of my listeners,

I shall mention only one more example, dealing with the manufacturing of tablets. Tablets containing acetylsalicylic acid with about the equivalent amount of magnesium oxide are much used in this country. The student prepares 2000 such tablets, according to two somewhat different methods. The tablet machine employed is a model found in practically all Danish pharmacies. Now follows the most important part of the exercise, viz., the assay and comparison of the prepared tablets. The average weights of tablets from each of the two lots are determined, and the contents of acetylsalicylic acid and magnesium oxide are calculated for tablets of average weight. Upon the basis of the material thus obtained, an objective comparison between the merits or demerits of the two formulas of manufacture is attempted.

The pedagogic result of this exercise is not only that the student has an opportunity to operate a tablet machine, and acquires a certain routine in the analytical examination of tablets, but as the chief point, his eyes are opened to the importance of the choice of method of preparation to the quality of the finished product. I hope by these few examples to have made my auditors understand the nature of the exercises in galenical pharmacy which are carried out by our students.

Internationally the remedies produced in pharmacies have for the last thirty years been fighting a desperate struggle against those made by commercial manufacturers, a struggle resulting in the constant retreat of the former. In several countries however, the armistice seems to be near, and it is to be hoped that the peace concluded after this Thirty Years' War will bring about a state of equilibrium satisfactory to both parties, neither of which can, as a matter of fact, do without the other. From the pharmaceutical point of view, the future development can be considered satisfactory only when galenical pharmacy attains its proper place in the individual pharmacies, as has been acknowledged to be the present condition here in this country.

I feel convinced therefore that the time has now come when all who have their work within the sphere of pharmacy, and wish to secure a bright future for their ancient profession, must agree that this is best done by a further development and improvement in the teaching of galenical pharmacy, the clinical science of the pharmacist. This side of the problem

is of international importance, while the practical arrangement of the teaching is the national side of the question.

And I want to conclude my remarks with an urgent appeal to our foreign guests not to forget that galenical pharmacy is a free and independent science, and that the development of this science means a reinforcement of the foundations upon which a practical pharmacy, satisfactory both scientifically and economically to its practitioners, is to be built up in the future.

The Biological Period in Pharmacy*

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Evolution means the passing on of a change—a change which must stick, generation after generation. In the evolution of the heavenly bodies, or of man, or of such a profession as pharmacy two decades is an infinitesimal while. But in evolution sometimes occur sudden changes of momentous importance, and these do not always require a long time. In the evolution of pharmacy we are certainly in such a period of change. An outstanding characteristic of this variation is reflected in the ideals of many pharmacists. In their attitudes toward those who are to fill their shoes within a few short years. Many of the elders of the profession are empiricists, and many of them recognize this fact. But they are not willing to have the shoes of empiricists filled with more youthful men from the same mould. Instead they demand more thorough training, and a deeper understanding of the "how" and "why". Mere categorical knowledge is not enough. Understanding is replacing memorizing. And to effect this understanding has come recognition of a science as vital to pharmacy as is chemistry. And as vital to pharmacy as it is to medicine and dentistry. The science of biology.

Over twenty years ago, in the *Journal of the American Pharmaceutical Association*, appeared an article by L. E. Sayre (1) dealing with biological products from the point

*Presented at the annual meeting of District No. 2, Philadelphia, Pa., March 7, 1938.

of view of the pharmacist. The author traced briefly the evolution of pharmacy in a few generations from the crude drug stage, through elegant pharmacy—the so-called “Elixir Period”, through the organic synthetic period, to the time of the world war, which he characterized as the biologic period in pharmacy. His designation referred to the serums and vaccines which then were being used extensively for the first time. At the present time, with new products of a biological nature appearing almost daily, and with a standard four year pharmacy course, there are additional reasons for emphasizing the place of biological science in pharmacy. It may be worth our while to note some of these reasons.

The majority of students graduating in pharmacy become retail druggists. So let us see first where biology touches these men and women after they have left the lecture hall and laboratory, and are engaged in the business of making a living. Biology is used here *sensu latus*, that is, as the science of living things. A meaning which is lost sight of in some discussions of pharmaceutical problems. It includes, of course, both botany and zoology, and the many subsiences of these two.

The practical druggist deals with many plant products; with crude drugs, their active principles and preparations. In some localities this contact may be almost negligible, but in smaller communities, and in certain city pharmacies herbs, seeds, etc., are sold extensively. There is no question that this phase of pharmacy is diminishing rapidly, in America especially, but anyone who conducts a drug store in a rural community can testify that it has not yet gone entirely. Twenty years ago the number of monographs in the United States Pharmacopœia which dealt with drugs or preparations from a plant source was nearly 10 per cent over one half of the total. Today it is nearly 10 per cent under one half of the total. And with over 200 fewer monographs, the number dealing with vegetable drugs or preparations is only slightly over one-half of the corresponding monographs found in the United States Pharmacopœia IX. However, there are still 108 species of plants given in the Pharmacopœia as the source of either a crude drug, active principle, or preparation.

Today, moreover, the retail pharmacist has to deal with a class of products of plant or synthetic origin which the graduate of twenty years ago knew not at all, or only re-

motely by reputation: the vitamins. Of course cod liver oil was official two decades ago, but it had no biologic assay, and no pharmacist knew about its vitamins. The druggist who occasionally sold a bottle never dreamed of what the future held for this smelly fish oil. Halibuts were the only creatures that were interested in halibut liver oil, and yeast was used for baking bread or brewing beer. I do not need to depict the vitamin situation in a retail pharmacy today.

Increase in the use of serums and vaccines has been almost as prodigal, although these had an earlier start than the vitamins, and were found in the Pharmacopoeia of twenty years ago. To many pharmacists serums and vaccines represent the principal contact that pharmacy has with biology. The refrigerators in which they are kept are labelled "Biologicals", and it is not unnatural to believe that these are the primary connection between drugs and living things. In truth, serums and vaccines represent but one link in the chain which binds pharmacy to biology. An important link, which gives truly the dual connotation of the term biology, because most of these agents used in the diagnosis and treatment of disease, are obtained from animals, and result from the action of plants upon these animals. The extent to which serums and vaccines are used today is indicated by the discussion given in *New and Non-Official Remedies*, where over sixty pages are devoted to these products alone.

Another phase of biology in pharmacy is the development of gland products. The oldest official drugs of glandular nature are the enzymes. No discoveries of particular importance to the retail pharmacist in this field have come within recent years. But paralleling the investigation of vitamins from plants has been the study of endocrine glands from animals. Products from these are found today in all pharmacies. Insulin and its wonderful properties are familiar to nearly every educated person. Twenty years ago they were known to not one. We all know of the remarkable medical results obtained through the use of thyroxin. And of the dramatic reduction in the incidence of endemic goiter obtained since the world war by the simple expedient of including iodine in table salt. To understand these miracles of modern medicine a pharmacist must know the biology of the thyroid, where it is, what it does, and how it concentrates the iodine of the body in its colloid. Surely one who knows the

mechanism of this vital "draft to life's furnace" is in a better position to recognize the dangers inherent in the indiscriminate use of thyroid as a weight-reducer by a public ignorant of the hazards involved. And no conscientious pharmacist with this biologic knowledge will hesitate to sound a needed warning. The most recent additions to the field of organ therapy have been the anti-anemia preparations, stomach and the extracts of liver, official now for the first time, and widely sold on prescription.

Another point where biology touches practical pharmacy is frequently overlooked: The control of insect pests. In rural communities the druggist's advice on insecticides is sought constantly. To be helpful here he must know something of insect physiology. He must at least recognize the difference between "chewing" insects and "sucking" insects, and the relation between the poisons and the feeding habits of the animals. Related to this is the eradication of rodents, and the elimination of parasitic worms from domesticated animals. In selling vermicides the druggist must know something of the types of worms, their habits, and the materials of value in killing them.

Finally, problems in public health confront every druggist daily. In many instances intelligent and helpful solutions of these problems depend upon his biological knowledge. One of our state journals of pharmacy carries on its cover this statement: "A well-informed Pharmacist is the best single individual to disseminate information about public health." He is the best *single* individual for this purpose because his sphere of intimate contact with his patrons is wider than that of the average physician, who, by training, is better equipped to disseminate information about public health. But let us not overlook the type of pharmacist referred to: "A *well-informed* pharmacist." Public health problems are largely problems in human biology, particularly those which the pharmacist must meet. He is asked to suggest means of fumigating after illness. His advice is sought on the treatment of venereal diseases. His store is the retail outlet for merchandise designed to prevent conception. A well-informed pharmacist knows enough about fumigation to estimate properly how much sulfur or how many formaldehyde candles to burn. He knows sufficiently well the dangers of self-medication for syphilis or gonorrhoea to send

his customer to a physician, and to refuse the responsibility of suggesting a remedy. He knows enough of the physiology of reproduction to discuss intelligently the various contraceptives, and to recommend consultation with a doctor where medical advice is needed.

The foregoing indicates some of the points of contact between biology and retail pharmacy. The list could be lengthened, but these examples serve to indicate the intimate relationship between the two. The colleges of pharmacy are meeting the needs for biological training with varying degrees of adequacy. The tendency is definitely toward a better preparation in such basic biological courses as general biology, and plant and animal histology; and toward more comprehensive training in such advanced fields as biochemistry, physiology, and pharmacology.

Even in the days of the two-year course fundamental training in botany was required, because botanicals then loomed larger on the pharmaceutical horizon than they do today. This traditional training is still being given, and rightly so. You will recall that our present Pharmacopoeia contains references to over 100 plant species. And the National Formulary gives 125 additional ones.

But the two-year course seldom included adequate training in animal biology. Within twenty years the number of official monographs on animal products has increased. The number of unofficial, but widely-used animal drugs has enlarged tremendously in the same period. Insulin, the sex-hormones, and many of the serums and vaccines are examples of such unofficial drugs. These additional animal products argue the need for sound zoological training for pharmacists.

But a stronger argument comes from the ideals behind the entire four-year course. Many, perhaps the majority, of us learned enough in two years to carry on successfully in retail pharmacy. We *memorized* sufficiently well to pass the state board examinations and to do creditable work in a store, but many things we did not *understand*. It is one thing to commit to memory the official definition of posterior pituitary, and quite another matter to clearly understand this definition, the origin of the synonym—hypophysis sicca, the relationship of posterior pituitary to anterior pituitary, and the majestic position of this "keystone in the endocrine arch."

With two more years in college more understanding should

result. If it does not, the added years are wasted. This understanding, in part, must come from a better knowledge of animal biology. It is indeed difficult to see how the official assay for digitalis, solution of posterior pituitary, or cod liver oil can be read and *understood* without knowledge of animal biology. How can a present day pharmacist discuss intelligently with a physician almost any of the newer pharmaceuticals without some knowledge of their pharmacology? And how can he know this without training in physiology and biochemistry? And what can he do but memorize the teachings of physiology without fundamental animal biology? Not one link in the chain can be omitted without loss of understanding, and with this loss go the gains postulated for the lengthened course.

One other phase of pharmacy which is becoming more and more biological in nature is manufacturing. A few decades ago our drug houses dealt almost exclusively with vegetable drugs and their preparations. Today, in one large pharmaceutical house, about one-third of the research work is in synthetic organic chemistry, a second third is in pharmacology, and the remaining third is on other biological problems, such as gland products, etc. This is representative of several of the larger manufacturers.

The logical question at this point is—What bearing does all this have on state board examinations? The answer, it seems to me, is self-evident. If the retail pharmacist is confronted daily with as many biological problems as chemical, if he is being continually bombarded with new pharmaceuticals of animal origin, if he has received additional biological training in his four year course, and if other phases of pharmacy are coming more and more to a biologic point of view, the candidate's knowledge of these practical aspects of his profession should be tested. Which is the more important: To know the nature of *althea* or *veratrum viride*, or the essentials about insulin? Is it of greater value to a pharmacist to know what portions of *aspidium* should be used in making pharmaceutical preparations, or the differences between serums and vaccines, and how these should be kept? Which is of greater potential value: To know that a sclerotium is the resting stage of a fungus, or the effects which are almost certain to result from the use of thyroid other than under the direction of a physician? If you object to

labelling any one of these more important than any other in the stock-in-trade of a pharmacist, we can certainly agree on the need for knowledge of all of them.

The House of Pharmacy has truly undergone an evolution. Each stage in the process has left its mark. The crude drug stage remains in over 200 plant species of the Pharmacopoeia and National Formulary. Many of these have a position of honor and respect. The "Elixir Period" resulted in vastly superior preparations whose improvement is a matter of constant concern and research. The organic synthetic period has never waned, and doubtless never will. The biologic period is with us now, in the true sense of the word: Search for new products of plant and animal origin, the testing of drugs on living forms where other means of standardization are not reliable, and a fuller understanding of the action on the body of all substances used in medicine.

Animal biology in its many aspects is only now receiving the attention it merits in pharmacy. Botany alone has occupied the biological chamber in the House of Pharmacy throughout the years. And like many people who live alone, she has become, in many instances, jealous of her position. She has granted little room to her sister-science zoology in most curricula and examinations. Meanwhile, many of the modern advances in pharmacy have depended upon animal biology. Apart from the classroom and examination hall pharmacy is as much zoological as botanical. Within, it usually is not. We should recognize that pharmacy is grounded in biology, as it is in chemistry, and that biology includes plants *and animals*. Botany must share her chamber, and a profession which gives due regard to the biological basis of pharmacy will find its practitioners more fully prepared to meet their daily problems, and to fulfill the demands of modern professional pharmacy.

Reference:

- (1) Sayre, L. E., J. A. Ph. A. 6, 861 (1917).

What is a Patent or Proprietary Medicine?*

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The Constitution of the United States, in Article I, Section VIII, enumerates among the powers of Congress the following: "The Congress shall have power to promote the progress of science and useful arts by securing for limited time to authors and inventors the exclusive rights to their respective writings and discoveries."

Under this section of the Constitution the Congress has passed our patent and trade-mark laws. An inventor of a new and useful thing is given the right to make and sell it for a period of seventeen years. A patent is essentially a contract between the government, representing the public, and the inventor. In return for the disclosure of his invention, the government protects the inventor by giving him a monopoly on the making and selling of his invention for a term of seventeen years. The monopoly granted is not the right to make the article discovered, because the inventor possesses that right anyway. The monopoly consists in the right to exclude others from making, using or selling any embodiment of the patented invention during the life of the patent.

Here we have laid down by the Congress of the United States, acting under the Constitution, a definite policy with respect to inventions of new and useful things.

Contrary to the general assumption that the discoverer of a new and useful thing is entitled to exclusive and perpetual rights therein, the policy of the United States government and of all governments is based upon the assumption that a new discovery belongs to the people, but as a reward for the disclosure of the discovery, the inventor can exclude, by means of letters patent, acquired in a lawful manner, any other persons from enjoying the fruits of his discovery for a limited period.

It is expected that at the end of seventeen years the inventor shall no longer enjoy the monopoly under the patent law, although careful and judicious marketing policies will

*Reprinted by permission from the *Scientific Monthly* for January, 1938.

give the inventor a leading advantage over competitors who may decide to avail themselves of the use of any product on which the patent has expired.

In the field of drugs and medicines, the term "patent" has come to have an added significance. Not often does it refer to a medicine or drug on which a patent has been issued. There are, of course, newly developed chemicals or processes for the manufacturer of chemicals on which patents can be secured. However, there is no such thing today as a "patented" medicine in the sense that the formula for preparing a mixture of drugs has become the basis for issuance of letters patent. The U. S. Patent Office has not been granting patents on mixtures of drugs in recent years, although such was the case in its earlier history.

In this connection it is interesting to examine the dictionary definition of the word "patent." Its meaning is given as follows: "Lying open; open; public; manifest to all; unconcealed; obvious; conspicuous; open to perusal of all, as letters patent; appropriated by letters patent; secured by law as an exclusive privilege; restrained from general use; patented; an official document—letters patent—conferring or granting a privilege; a patent of nobility; a patent conferring right to engage in a particular trade usually to the exclusion of others; a letter of indulgence; a pardon."

Any one having to deal with laws enforcing regulations with respect to drugs and medicines would be intrigued by the first definition given. A patent medicine, so-called, is anything but a product of which the composition is revealed or which has a formula "open to perusal of all." Common parlance has given the word "patent" with respect to medicines a meaning which is the exact opposite of its dictionary definition, for patent medicines are generally considered secret formula products rather than open formula products.

The trade-mark laws of the United States have been employed in a very adroit manner to perpetuate the monopoly on patented products. If the individual who registers a trade-mark for a patented product is careful enough to apply his trade-mark in such a manner that it will indicate the brand of the patented product rather than the patented product itself, he can acquire unlimited exclusive rights to the brand name and by clever advertising he can continue to enjoy a virtual monopoly on a given product even after his patent

rights have expired. Let me illustrate: The term "aspirin" was made synonymous with acetylsalicylic acid from the beginning of the marketing of that product in the United States. A patent was obtained on acetylsalicylic acid, but the manufacturer popularized the product under the name of "aspirin" and "aspirin" became the accepted name rather than the brand name for acetylsalicylic acid manufactured by the holder of the patent. Accordingly, when the patent expired, the term "aspirin" had acquired a place in the language of commerce and in the language of medicine. Exclusive right to the word "aspirin" could not be vested in the originator of the product after the patent had expired, because he had not taken the trouble to preserve the word "aspirin" as his brand name of acetylsalicylic acid.

The introducer of phenobarbital, on the other hand, was very careful to popularize the name "luminal" as the name of his brand of phenobarbital, and when the patent on this chemical expired the trade-mark "luminal" remained in effect and was renewable and is renewable at twenty-year intervals so that other manufacturers of phenobarbital may not use the trade-mark "luminal."

It can readily be gathered from even this superficial discussion of the subject that it is possible by the use of coined trade names registered with the U. S. Patent Office as trade-marks to go a long way toward perpetuating a monopoly on a given drug or chemical. By means of advertising and propaganda, the brand name of the product is made familiar to consumers over a period of seventeen years, and it is then very difficult for others who endeavor to manufacture the product at the expiration of the patent to convince consumers that their product is not an inferior substitute. However, there is greater opportunity today through advertising to break down the monopoly granted by way of trade-marks, and there would be even greater opportunity along this line were it not for the tacit understanding among the better class of manufacturers of drug products not to appropriate one another's patented products upon expiration of the patent.

Practically every pharmacy law in the United States makes a distinction in the regulations of the sale of drugs and medicines and the manufacture and sale of so-called patent and proprietary medicines. The regulations with respect to the sale of drugs and medicines are stringent. The regulations

with respect to the production and sale of so-called patent or proprietary medicines are very loose. Legislatures enacting pharmacy laws for the first time, some seventy or more years ago, were importuned to restrict the sale of drugs and medicines to registered pharmacists or persons working under the supervision of registered pharmacists. The patent medicine industry was sufficiently well organized, even in those days, to have inserted in all these laws a provision completely exempting patent or proprietary medicines from the provisions of such laws. The terms "drug" and "medicine" are generally defined in these laws along lines of the definition in the Food and Drugs Act. However, there is, in general, no definition given for patent or proprietary medicines.

When a definition is given, it is usually so worded as to include anything worth including as far as the patent medicine manufacturer is concerned and to exclude anything which would burden such manufacturer with any restrictions or responsibilities.

A definition for patent or proprietary medicine which has become a classic from the legal standpoint because it was handed down in an early court case involving an alleged violation of a state pharmacy law is that given by the Supreme Court of the State of Minnesota in the Donaldson case. It reads as follows:

It is a matter of common knowledge that what are called "patent" or "proprietary" medicines are prepared for immediate use by the public, put up in packages or bottles, labeled with the name and accompanied by wrappers containing directions for their use, and the conditions for which they are specifics. In this condition they are distributed over the country in large quantities and sold to consumers in original packages, just as they are purchased by the dealer, without any other or further preparation or compounding.

The American Medical Association through its Council on Pharmacy and Chemistry has adopted the following definition:

The term "proprietary article" shall mean any chemical, drug or similar preparation used in the treatment of disease, if such article is protected against free competition, as to name, product, composition or process of manufacture by secrecy, patent, copyright, or in any other manner.

The Commission on Proprietary Medicines of the American Pharmaceutical Association proposed the following definition:

In its widest sense, a proprietary medicine is any drug, chemical or preparation, whether simple or compound, intended or recommended for the cure, treatment or prevention of disease, either of man or of lower animals, the exclusive right to the manufacture of which is assumed or claimed by some particular firm or individual, or which is protected against free competition as to name, character of product, composition or process of manufacture by secrecy, patent, copyright, trade-mark, or in any other manner.

This definition probably states the status quo correctly, but if it were accepted as a legal definition the field of "proprietary medicines" would be greatly enlarged and that of "drugs and medicines" greatly restricted.

It is, of course, manifest to any one who has studied the situation that most of the so-called proprietary and patent medicines are mixtures of well-known drugs devised to meet some condition which they are claimed to cure or relieve. The tendency to develop private formulas has been accentuated in recent years to the point where a pharmacist who is educated to prepare and compound medicines based on official drugs and preparations finds himself in a position of great bewilderment when he attempts to practice his profession in a prescription room labeled with new combinations of drugs offered under fanciful names and with prescriptions from physicians calling for all types of combinations of official and unofficial drugs prescribed under names assigned to them by manufacturers and registered as trade-marks.

In order to avoid duplication of names by the manufacturers themselves, the American Drug Manufacturers' Association maintains a pharmaceutical trade-mark bureau with which the members of the association can register new names, and these are made available to other manufacturers so as to avoid costly litigation or wasting of time in searching trade-mark records when it is necessary to coin a new name. A mere glance at this register under two important headings—*Digitalis* and *Ergot*, for example—will indicate the "confusion of tongues" that prevails in the modern prescription department when an inventory is taken of these preparations and the difficulty met by the conscientious pharmacist who tries to keep in touch and up to date with this field.

The names for *Digitalis* preparations registered with the American Drug Manufacturers' Association follow: *Digicardalis*, *Digicardium*, *Digidin*, *Digifol*, *Digifortis*, *Digiglusin*, *Digiloid*, *Digilutea* Upsher Smith, *Diginfuse*, *Digipit*, *Digipit*

No. 2, Digipura, Digiquin, Digirex, Digismith, Digitaalex, Digitaligen, Digitalone, Digitan, Digitex, Digitol, Digitone, Digtora, Digtos.

The names for Ergot preparations registered with the American Drug Manufacturers' Association follow: Ergaloids, Ergo-Aloe, Ergoapiol, Ergoettes, Ergone, Ergonol, Ergophene, Ergophenol, Ergopit, Ergopit No. 2, Ergo-Quinine, Ergosekalo, Ergo-Stat, Ergot Aseptic, Ergotean; Ergot, Fluid Extract, "Formula of 1874"; Ergo-Thaelin, Ergothesin, Ergotole, Ergotora, Ergot Potent, Ergotrate, Ergozin, Ergo Zinc Comp., Eryne, Erpiol.

Two recent advertisements of so-called ethical proprietaries tell a significant story in a very few words. Parke, Davis and Company are advertising Kapseals Ventriculin with Iron and Vitamin B. The formula is given as follows: Ventriculin—5 grains, this is the proprietary name for Stomach now official in the U. S. P. The next ingredient is Naferon—2 grains, this is Iron and Ammonium Citrate Neutral and then there is some Vitamin B₁ and Vitamin B₂. This mixture is ready made and put up in capsules, but in order to identify the capsules a yellow capsule is used with a black band around the center which makes this a Kapseal rather than a capsule. Not only by coining a name for the ingredients, which are common official drugs, but also in the manner of dispensing did Parke, Davis and Company appropriate to itself the exclusive right to this formula. A pharmacist putting up Dried Stomach and Iron and Ammonium Citrate Neutral with Vitamins supplied in some form in a plain gelatin capsule would be a substitutor and guilty of a heinous offense. A general merchant selling Kapseals Ventriculin with Iron and Vitamin B would be wholly within his rights under the pharmacy laws, because undoubtedly Parke, Davis and Company would claim that this is a proprietary preparation. The reference here has been to a medicine which would be prescribed by physicians ordinarily, but which will soon become an article of commerce if it is found to be of any value in some special condition and the word is passed along from one patient to another. For the present, it will doubtless remain a prescription product, but the common patent medicines of today have been prescription products in the past.

E. R. Squibb and Sons have recently announced the mar-

keting of Ammonium Mandelate under the name of Mandamon. The Squibb brand of Ammonium Mandelate is trademarked under the name of Mandamon. Apparently it is not sufficient to specify "Squibb" in connection with Ammonium Mandelate. The physician is importuned to prescribe this product under the name of Mandamon, and hence the pharmacist who possesses a chemically pure Ammonium Mandelate in his stock would be considered a substituter if he were to supply this upon a prescription calling for Mandamon.

If there is to be any control over the sale of drugs and medicines, a way must be found to extend that control over all medicines, regardless of the fact that they are classified as "patent or proprietary preparations" through the arbitrary use of these terms in our pharmacy laws or through a conversion of the meaning of these terms to suit the purposes of manufacturers.

A good illustration of the further abuse of privileges granted in connection with the sale of patent or proprietary preparations is the insidious development of taking common official drugs and medicines, changing their formulas slightly, giving them fanciful names and palming them off as new discoveries to be sold without the restrictions that govern the sale of drugs and medicines. A case in point is the Citrate of Magnesia situation with which many states are confronted today.

The Crescent Bottling Works of Newark, N. J., has been supplying general merchants with a product labeled "Duke's Magnesia Vitro-Tartrate," which upon analysis was found to be a Solution of Citrate of Magnesia approximating the U. S. P. formula but somewhat deficient in Citrate of Magnesia according to the U. S. P. standard. Under the laws of New Jersey, Solution Citrate of Magnesia, being a drug and a medicine, can be sold only under the supervision of a registered pharmacist. By a slight alteration or adulteration of the U. S. P. product and giving it the name "Duke's Magnesia Citro-Tartrate," the attempt was made to classify this product as a patent or proprietary medicine which, under the laws of New Jersey, may be sold to any one without supervision. The facts in the case were brought before the Court of Chancery of the State of New Jersey because the Board of Pharmacy had taken the position that Duke's Magnesia Citro-Tartrate was a medicine and a drug and not a patent

or proprietary medicine within the meaning of the pharmacy act, regardless of the name which had been appropriated by the manufacturer. In the district courts, merchants who had sold the product were penalized when the board demonstrated that the product sold was an adulterated Citrate of Magnesia preparation in a Citrate Magnesia bottle but with a fanciful name. The manufacturer, considering himself aggrieved because such procedure led to reduction of sales, went to the Court of Chancery for the purpose of enjoining the Board of Pharmacy from enforcing the pharmacy act in accordance with its interpretation. A temporary injunction was granted, but upon final hearing the vice chancellor hearing the case held that "the product in question was merely common Citrate of Magnesia, a recognized drug preparation, slightly adulterated and of slightly less potent character, and hence within the prohibitions of Section 2 of the pharmacy act." Accordingly, he vacated the preliminary injunction and dismissed the bill.

The manufacturer carried the matter to the Court of Errors and Appeals, which is the highest court in the state, and this court upon reviewing the evidence gave it as its unanimous opinion that "on the evidence, the above finding of fact is manifestly right." Accordingly, the decree was affirmed.

This indicates clearly that when the nature of the subterfuge practiced by manufacturers under the exemption clause of the pharmacy acts is presented to the courts in its true light, they are not fooled. It also indicates that the clause in most pharmacy acts which exempts so-called patent or proprietary preparations from their provisions is not iron-clad, but is in fact vulnerable if enforcement agencies will take the trouble and pains to establish the facts.

In the writer's judgment entirely too much has been taken for granted in connection with this exemption clause. It does not seem logical that the courts of the United States are willing to give the patent medicine manufacturer the benefit of every doubt all the time. In most instances where court decisions have been rendered on this subject there has not been as much expert testimony and expert legal guidance in the presentation of the case on the part of those opposing the patent and proprietary medicine interests as there has been on the part of these interests.

An illustration which might be cited is in the field of proprietary disinfectants. In some states it is unlawful for any one to sell poisons except under the supervision of a pharmacist. Manufacturers of insecticides and disinfectants containing poisons have adopted the simple expedient of leaving off the label the word "Poison" in cases where their product is shipped into states requiring sales to be made under the supervision of pharmacists. A case in point is the product Klenol. First it was supplied in New Jersey with a poison label. When the company manufacturing this product became aware of the fact that the New Jersey law prohibits the sale of poisons except under the supervision of pharmacists, the product Klenol appeared without a poison label. It is the same product and the question arises, is it or is it not a poison?

Our food and drug laws and our pharmacy laws are very specific in their requirements with regard to the sale of drugs and medicines and with regard to the manufacture of drugs and medicines. As matters stand today, the public receives ample protection by law where such protection is least necessary. In the great field of so-called patent or proprietary medicines, almost anything goes and will continue to go until we correct the outworn classification of medicines into the present divisions of plain "drugs and medicines" with revealed formulas and "patent or proprietary medicines" with secret formulas. Such a classification is purely in the interest of manufacturers relying upon trade-marks and secrecy for the protection of their business interests and contrary to the public interest which demands revealed formulas in open competition for such types of self-medication as may be considered safe and harmless.

Some years ago the Committee on the Costs of Medical Care expressed itself on this question in the following words: "The manufacture and distribution of medicines, because of their intimate relation to the health and welfare of a community or nation, partake of the nature of public utilities. In view of the shifting of control from professional to financial hands, manifested by recent developments in the drug industry, the public interest may require 'regulation' of the industry, through the guarantee of a fair return to investors and the limitation of prices to be charged to consumers."

The first and most important effort in this direction should

be the elimination of the arbitrary line of demarcation between drugs and medicines and patent or proprietary medicines. The terms "drug" and "medicine" encompass anything that might be conceivably prepared or distributed under the classification of patent or proprietary medicines. If we classify all remedial agents as drugs and medicines under our pharmacy and food and drug laws, the public will receive equal protection in connection with all types of remedial agents. As soon as we create a separate classification, such as patent or proprietary medicines, whether these terms be synonymous or whether they are given individual meanings, we are drawing an arbitrary line for which there is no justification in fact.

Manufacturers of so-called patent or proprietary medicines have created for themselves special privileges under the laws of the several states, which constitutes the rankest kind of class legislation and which no legislator can justifiably approve when he is confronted with the facts.

We need not deny a manufacturer property rights in patents for chemicals or drugs acquired in a legitimate manner. We may even be justified in procuring by law exclusive rights for limited periods to manufacturers for new discoveries and combinations which are not patentable and which contribute to the general welfare and to the progress of medical science and the healing arts. If the government of the United States and other governments throughout the world consider it a fair and equitable policy to *limit* the *exclusive* rights of inventors to their respective discoveries, why should these same governments grant to those who appropriate the discoveries and the fruits of the labor of other such rights *in perpetuity*?

The legitimate drug industry exists as a subdivision of the medical profession. Its obligations to the people are fundamentally the same as the obligations of other professions which provide medical care. Its legitimate economic interests should be protected, but it is not entitled to a permanent monopoly on the scientific achievements of others nor even on its own scientific achievements. To argue otherwise is to argue in favor of suspension of progress in medical science. That an unfair monopoly exists today is apparent to any unbiased student of the situation. That this unfair monopoly hangs largely upon an outworn, outmoded and ar-

bitrary classification of drugs in our pharmacy laws has not been fully recognized. The abolition of this outmoded and unfair classification is in the interest of the public health and welfare and should be brought promptly to the attention of every legislature in the United States with the proper supporting facts.

Techniques on Library Searching*

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The speaker may give you some help in training your students to find and use pharmaceutical literature. But his position should be made clear at the outset. He knows practically nothing about pharmacy and medicine. He did wonder some years back how a student in the Rutgers University College of Pharmacy could possibly memorize anything like all the items its faculty expected him to commit to rote memory. Recently he has been able to observe the work of two medical students at his own university. Regarding library materials, he assumes he is in the same boat as those present. He is not a librarian, never had a day's training as one, but has long been a constant user of books and other library materials in his field.

Schools of pharmacy probably have pretty much the same situation we have in education. That is, the growth of published materials has run far ahead of the ability of students to know and use them profitably on any haphazard or incidental basis. Furthermore, you must have so many good things coming out in pharmaceutical literature that you know full well you can't give your students all the published materials they will need to know in their lives. You realize your students must keep up on their own after they leave your classes.

The surest guarantee for a man's keeping up in his profession is a certainty that he knows where to find and how to use profitably the most useful library materials for that profession. In education, on a practical problem or on a re-

*Adapted from address before the Conference of Teachers of Pharmacy, New York City, August 16, 1937.

search, if anybody knows the answer, the chances are a hundred to one that this answer exists in available library materials. If no one knows the answer, the best data for securing the answer are almost certain to be in such materials.

You may be helped by what has been done in securing a more effective command of library materials by students in a professional school for educators. Years ago the speaker, then a professor of school administration, felt he had to do something about getting the students in his classes to use the library more efficiently. Five years ago he was assigned full time as library professor to help graduate students in all departments at Teachers College.

The first thing to be done was to find out what specific library knowledges and skills were needed by the students. No hair-splitting distinction between a knowledge and a skill was deemed necessary. A knowledge was considered what one needed to know in order to do a certain thing; the corresponding skill was efficient practical application of that knowledge. A compilation of such knowledges and skills had to be made for there was nowhere anything like a satisfactory list of these items. The list was formulated by interviewing a great many students, by studying faculty class assignments, by getting the opinions of faculty members, and the like. This list, as was to be expected, was long. It was soon evident that students felt that for their best work they needed to become acquainted with certain periodical and reference books, certain library techniques, and certain library tools and indexes, not adequately covered in their regular courses, even under their major professors.

The next problem was that of setting up assignments that would give the student experiences with library materials sure to result in his acquiring the desired library knowledges and skills. It was early found best to have these assignments consist chiefly of questions whose answers could be found only by going out into the library and using its materials. To give the student as powerful a motive for learning as possible, the questions were practical ones that a school man or an educational researcher would really wish to answer. Also, the student was allowed to choose his own exercises or parts of exercises, with the advice of the instructor. It took the instructor considerable time during several years to make

up a satisfactory set of exercises and the thousands of questions involved. The exercises and questions may be deemed pretty successful since most of his students desire to take more than their time allotment permits. They have to be called off rather than urged on.

The practical value of the questions will be clearer from an example. Take the case of a man training for superintendent of schools. He needs to know how to get in touch with the people who count in his professional advancement. You can ask him questions about such people that he will wish to have answered, but can't answer except by going to the directories and biographical books you wish him to learn to use. In the speaker's experience, a very capable Phi Beta Kappa man from a famous eastern college was saved from locating in an undesirable private school by using such books. A Ph.D. man from a noted eastern university attributes his present position in a good university to a tactful remark he made to the president when he went to see about the place. He had been prepared with the information needed for making the remark, by such books. Neither man had before known how to get such information. The published exercises¹ will quickly show the numerous other equally practical questions for training educators to use library materials successfully.

To answer the questions employed for the acquisition of the needed library knowledges and skills, students needed much information. They needed it on sources and on the best ways of working. Much of that information was already in existence among librarians and educational researchers. But it was widely scattered and nowhere collected in any really usable form for students. The instructor had to make the information available himself. He first gave it in lectures but that was altogether too wasteful of energy so in 1935 he published it. This book² contains the factual information on sources and the suggestions for improving one's

¹Alexander, Carter. *Alexander Library Exercises*. For use with the same author's *How to Locate Educational Information and Data*. New York: Bureau of Publications, Teachers College, Columbia University, 1935. 101 p.

²Alexander, Carter. *How to Locate Educational Information and Data*. New York: Bureau of Publications, Teachers College, Columbia University, 1935. 272 p.

library skills, needed to answer efficiently the questions of the library exercises.

The instruction is given without class meetings, the idea being that students in learning to use the library ought as far as possible to get their directions in print. A few mimeographed directions are issued for each class to give for our special institution the information necessary to supplement the directions in the exercises which may be used in any teacher training school. The exercises contain enough work for four semester hours of credit. A student ordinarily chooses enough exercises or parts of exercises, with the advice of the instructor, to make a total of two or three hours of credit. The student does his exercises, turns them in, has them corrected, learns from the corrections how to improve his library work, and has conferences with the instructor as needed. An examination under pressure easily shows up the very few students who do not do their own exercises. The flexibility appeals to most students. One student easily completed two semester hours of credit in a total of sixty-five hours. Some students take two hundred hours and do very poor work. The average is around ninety to one hundred hours, a normal amount for two semester hours of credit.

The work is highly valued by serious students who really wish to learn. It is avoided as the plague by the sons and daughters of rest. Many of the faculty strongly endorse the training, but some of them cannot understand how the instructor can conduct a class without talking. The instructor's psychology for his class without meetings is as follows. He is trying to give his students skill in using library materials and resourcefulness in finding such materials best for solving their individual problems. Now, in acquiring a skill, certain things are true. No student can acquire a skill when the instructor takes all the exercise, as we know perfectly well from physical education. We also know from that field that a coach trying to improve a man's technique in swimming or football, must first see him in action. The instructor in library research must then first see the student in action in the library. Once he sees the student in action, he can find out where the student is weak and give helpful suggestions for improvement. If the student is allowed to choose questions he really wishes to answer, he will be certain to go into action.

If you are interested in teaching your students how to

use pharmaceutical library materials more efficiently, three items from the speaker's experience with education students may help you.

First, many a student has a lot of trouble in using library materials and in writing papers based on them, because his instructor does not distinguish between a write-up outline and an outline for doing the job of getting something to write up. When a student starts out on a term paper or on a research involving library materials, he does not know how the work is going to wind up. Consequently, he has at first no need for a write-up outline. He does, however, need to outline his procedure for getting something to put on paper, that is, his procedure for doing the necessary library work. The speaker's ripest experience gives the following plan as best for outlining this procedure.

The student first puts down a title. Next he lists the problems he wishes to solve or the questions he desires to answer. His third step is to put down the things he would have to do to solve his problems or get his answers. Next he lists the books and other library materials he needs for doing the things he must do to get the answers. His last step is to note how he would go about getting the answers with the aid of the library materials necessary.

Only after the work has been done according to such an outline, does the student need a write-up outline. Only then is it profitable for him to figure on what to put into an introduction, what to have as the titles of chapters, and the like.

Second, the instruction should emphasize that successful use of library materials is largely a matter of common sense which may still be intensely interesting. It is planning what needs to be done, getting the answers, repeating phases where one needs more practice, and then going on to something new. It is easy to show students that library searching is a form of high-grade detective work. There can be just as much fun in looking for a clue or in hunting down a reference from a faint clue as there is in solving a good mystery story. The instructor in such a course has need for this attitude since his students will bring him questions, the procedures for successfully answering which will sound like a mystery story where every possible suspect is eliminated until only the guilty person is left at the last.

An example from the writer's experience will make this clear. Several years ago in summer teaching at the University of Texas, one of his students asked help on locating an article. This had been a study of two entering groups at Stanford University, one of which had had the traditional curriculum, the other a modern course of study. The student wanted the article to help him get a modern high school curriculum in his high school. As the student did not remember when or where he had read the treatment, did not in fact even know whether it was a periodical article or a chapter in a book, the problem was a first class mystery story.

To start, it was necessary to decide whether he had read something in a book or a periodical. He finally decided it must have been in a periodical. Then the date had to be approximated. He concluded on this that he must have done the reading in a certain summer at Ohio State University. This in turn indicated that the article would have to be located in some index covering periodicals before 1929, the year in which the Education Index began. From his recollection, the article must have been a technical one, in which case the International Index would have probably listed it, the Readers Guide covering only popular articles on education. As he did not know the year, several volumes of the International Index had to be consulted. As he had no idea of the author or title, he had to try several headings. The few volumes of the International Index turned up the article in about twenty minutes. He had been vainly trying for two years, often with the help of library assistants, to run the article down. Had the speaker's book been available, the student could easily have done all this by himself months before.

Third, the most important technique for library searching for a question brought to the instructor, is often a clearing up to find precisely what the question really is. Such clearing almost invariably gives clues as to where the answer may be found. The student's verbal statement of the question may be exceedingly vague, and yet he may have a real problem. Asking him what he intends to do with the answer often clears the question up more quickly than any other procedure. Then the question can be examined to see what type it is. A fact type question of the meaning variety in-

dicates a dictionary at once for the answer. This would certainly be true of a pharmaceutical term for which the pharmacists used a different terminology. Or the question may be of a numerical or statistical type, which in turn points to certain kinds of reference books for the answer. The question may turn out to require the exact wording of a law, which is naturally to be found in the proper statutes or law abstracts.

If you teachers of pharmacy desire to train your students to use the library materials they need in your colleges and those they will need all their lives, you should, in the speaker's judgment, do something similar to what he has done for educators. You need to develop exercises made up of questions the students really need and wish to answer, which can be answered only by work with library materials you wish covered. These questions will need to be worked out with great care. You will need also a handbook of factual information necessary for answering the questions, specific directions for finding and using the requisite library tools, encyclopedias, dictionaries, indexes, and the like, all for your special field and allied fields.

All this will mean a great deal of hard work for some one or for a committee of your association. You will never, in the speaker's judgment, get the exercises and handbook worked out by anyone else. Nor will you ever get a book in any other field that will amount to much for use in your special area. But if the exercises and handbook are properly prepared and rightly used, you will shortly note a remarkable change in the ability of your students to find and use the library materials they need. At present most of your students, in this respect, are doubtless in the horse and buggy era. The exercises and handbook would soon have them in the airplane age.

ABSTRACT OF DISCUSSION

Asked how he teaches students to make proper lists of sources of their material, Dr. Alexander replied that he insists that no reference not actually used be included in a bibliography. Also, he emphasizes that for important statements or disputed things there should be a citation. He reduces mechanical work by using a special bibliography card, designed for education, but applicable to other subjects. Students are taught to make bibliographies in the form required where the article is to be published because, for example, the United States Office of Education uses a form that differs from that of the University of Chicago Press.

Chemistry as an Aid to Pharmaceutical Progress*

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To a large extent the chemistry of today has its roots in the pharmacy of yesterday. In fact, it has been argued with much justification that modern chemistry, as we are familiar with it, was sired by pharmacy, for many a saint of chemistry was either an apothecary or received his scientific training in an apothecary's shop. That the child has been virile and has developed beyond his parental confines is a matter which needs no elaboration here; one need but be reminded, for instance, that in the American Chemical Society there are some seventeen Divisions, and that the Division of Medicinal Chemistry is one of the smaller ones. Furthermore, look where we will, touch what is near at hand, everywhere one finds the almost miraculous results of the chemist's efforts. Therefore, I should like to sketch briefly again, for it has already been done many times, just what chemistry has done and can do for pharmacy, how the brilliant son, as it were, helps the venerable father.

It would be trite, not to say presumptuous, to go over with you the ground that you already know so well. For any pharmacist worthy the name must, I am sure, have cause many times daily to feel grateful for at least two things which chemistry has done for pharmacy, and if chemistry were doing no more than these it would still justify itself. The first, is the purification and isolation of the active principles of so many crude drugs; the second is the analytical procedures which make it possible for the druggist to dispense medicines of uniform dosage and standardized potency. It is true that all needful work along these lines is not yet completed, nor is there any indication that chemistry is going to abandon the task. Here, then, are two ways in which the child is helping the father.

In purifying and concentrating the active principles of the classical crude drugs, like opium, cinchona and others, and in providing standards for assay and uniformity, the chemist works with materials that nature supplies and his task is to solve nature's riddles. Also he is already quite

*Read before the Baltimore Branch of the American Pharmaceutical Association, November, 1937.

well acquainted with what clinical results he may expect, or at least should expect, from the purified principle. Consequently, it is a relatively easy procedure for the drug to receive the medical recognition it deserves.

But chemistry goes still farther even than that in helping the parent. For instance, after Wöhler, with his synthesis of urea, placed organic chemistry on a solid foundation, the child has come home at frequent intervals with a new drug, many of which perhaps the pharmacist and the physician had not even dreamed. Thus there have been added to the *materia medica* new and useful substances, most of which do not duplicate the action of drugs from natural sources. What pharmacist is there, who could manage his shop without aspirin, the barbiturates, the antiseptics and the anesthetics? Where would medical science be today without the anesthetics, all of them except cocaine obtained from synthetic sources?

The synthetic drugs that chemistry has brought back to the apothecary have come in many curious ways and from strange and unexpected places. Saccharine came out of the chemical laboratories of the Johns Hopkins University; I am told by a contemporary student of the time, that the man who worked on it, not with the intention of finding anything sweet, had gone from the laboratory to his boarding house and sat down to dinner without first washing his hands. Other drugs have been discovered as the result of aggressively organized research programs. Still others have come as results of mistakes, e. g., acetanilid which was dispensed by mistake on a veterinary's prescription for a vermifuge, the veterinary observing the fall in temperature of his animal patient. The prize mistake undoubtedly was the suggestion that young William Henry Perkin, then an assistant to August Wilhelm von Hofmann, synthesize quinine by the oxidation of aniline! The quest for synthetic quinine was and still is both legitimate and laudable, but one should never treat aniline with chromic acid for that purpose! Suffice it to say that young Perkin was astute and he realized that he had, none the less, made a big discovery, for we know only too well that from that failure to obtain quinine was born the dye industry. While Perkin founded an entirely new science and industry even this grandchild of pharmacy, as it were, did not forget his ancestry, for many of the

diagnostic stains and antiseptic dyes are recognized as valuable in modern therapy. Even salvarsan, or arsphenamine, a child of the dye industry, has come to grace with considerable credit the medical armamentarium.

Thus one might continue with other examples. The New and Non Official Remedies and the United State Pharmacopœia are ample testimony to this fact, for of the official or "accepted" products approximately 140 are of strictly synthetic origin. Nor is the end in sight; rather it appears that "this is only the beginning, folks, only the beginnin'." Nearly every chemist, it seems, regardless of his field of endeavor or research, is interested in medicine, the possibility of finding something that will prove of value in combating illness. Thus at Harvard, Yale, Wisconsin, Mary Baldwin College, Roanoke College, even at duPont's, Mallinckrodt's, American Cyanamid, everywhere we find chemists interested in what I like to call modern Iatrochemistry. As one mingles with chemists at their various meetings and conventions, he will always find them interested in drugs, matters affecting health. Take the next Organic Symposium, which will be held at Richmond during the coming Christmas holidays, seven out of seventeen scheduled papers are of direct and immediate interest to Iatrochemistry and others have an indirect bearing on it. As another instance, consider Vitamin B₁ which is certainly of considerable pharmaceutical interest; the chemical work on this important compound was done either by or under the supervision of Dr. R. R. Williams, the Chemical Director of the Bell Telephone Laboratories. As another unusual source of research that has a direct pharmaceutical bearing consider the ultracentrifuge. Those of you who had the pleasure of hearing Dr. The Svedberg, on his recent visits to this city will recall that he is able to separate from sera those protein bodies which are responsible for antigenic activity. Consider the results of Wyckoff, who is able to purify and isolate viruses.

Let us return, for a moment, to the synthetic drugs. Approximately 140 have the approval of organized, conservative pharmacy and medicine. Yet in the chemists' lexicons are listed some 350,000 compounds. Think of it, 0.04 per cent, a ratio of 1:2500, have found their way into medicine. Why is this?

As mentioned before, when the chemist works with the principles of crude drugs he examines something with which medicine is already familiar, its activity probably having been determined during the centuries by the trial and error method on human beings. None knows how many lives have been sacrificed in placing what we are prone to look upon as medical folklore on a sound, safe and workable basis. But following Wöhler, new compounds began to appear so rapidly that to apply the old procedures might have proved disastrous, for we all know that many of the compounds that the chemist synthesizes are not only worthless as drugs but may be extremely harmful. Consequently, when the chemist comes with a new compound, the doctor and pharmacist are completely justified in asking, "What action may we expect from this compound? What makes you think it ought to be worth anything as a drug?" Well, the chemist is no Cleopatra; he has no prisoners on whom he may scientifically evaluate his products; consequently the chemical investigator is stymied. Fortunately, however, the pharmacologist has come to the rescue, at least to some extent. But progress is still too slow. Sulfanilamide, for instance, was first known in 1908, but it had to wait for nearly thirty years before it found its way into honorable and respectable drug circles.

Another simple compound which already excites the public imagination is nicotinic acid. This acid was first reported by Weidel in 1879; and its amide was reported by Engler in 1894. In September four Wisconsin scientists, working in the same laboratories where viosterol had its birth, reported that nicotinic acid cures black tongue in dogs, and that the amide of the acid may be isolated from liver concentrates. Black tongue in dogs is, so far as now known, the only disease in animals that parallels pellagra in humans.

Who knows how many other genuine gems are hidden away in the lexicons and musty vaults of chemistry that will one day come to light to occupy a coveted place on the druggist's shelves?

When the chemist does find, in his laboratory, a substance that is of medicinal interest, one of the first questions he must be able to answer is: "Is this the best of a series? Does it possess optimum activity and minimum toxicity?" In order to anticipate the answer he makes homologs, analogs and all possible related compounds, and from the group

the best is finally selected and made the queen bee; the rest, certainly of educational value, are quite promptly forgotten. This is quite different from materials supplied from natural sources; the pharmacist either accepts or rejects what nature provides; he does not ask it to modify the molecule. The chemist, however, is not so readily dismissed. For example, Lamson examined, perhaps, some thirty to forty compounds before he was satisfied that hexylresorcinol is the best ascaricide. Propadrin, recently accepted by the Council on Pharmacy and Chemistry of the American Medical Association, is one of a series of some thirty-five related compounds. Possibly several hundred barbituric acids and derivatives described in the chemical literature but less than a dozen which have medical approval. Even with the natural drugs, the pharmaceutical and medical professions would appreciate some modification which improve their value. Thus, hydroxyethylcupreine is showing a very desirable action as a specific in certain types of infection from the pneumococcus.

One might discuss also the accretions that have come into medicine by way of the biochemical field. These are of two kinds, viz., the vaccines and antitoxins, which are cultivated, so to speak, in animals, and those products which are elaborated normally and directly by the organism. Here we have the hormones, such as theelin, epinephrine, thyroxine, insulin, pituitrin, etc. It was Professor Abel, I believe, who referred to the body as the best drug store of all; and it is only within recent years since any attempt has really been made to find out what a store we have there. We need have no apprehension that this field of investigation will be neglected or abandoned.

Sufficient has been said to show that we may answer with a resounding affirmative the question, "Has chemistry been of any assistance in the advance of pharmacy?"

Now what of the future? In a broad sense we need have fear on that score. In a sense it may be said that only recently have medicine and pharmacy hit their stride, and now they are in a better position to meet their responsibilities and accomplish the tasks that lie ahead of them. Yet as one looks back over the path by which we have come he will see that substantially all the forward steps in pharmacy have come from outside the profession itself. The recent advances have, in the main, been contributed by biology, bacteriology

and chemistry, either as such or from their various ramifications. To be sure, the pharmaceutical profession has contributed to the art of pharmacy, but beyond that what has it contributed? I feel that this is a fair question, for are we always going to ride in the other man's chariot? You may counter, "What of Professor Thompson's ergostetrine?" True, and I agree that his was an outstanding and meritorious piece of work and I feel that all pharmacy, especially the educational end, should be justly proud of that and of the fact that Dr. Thompson's exhibit at a convention of the American Medical Association was the first from a school of pharmacy to win "Honorable Mention." But after that what can pharmacy say?

It is true that the pharmaceutical manufacturing firms, especially those in the front rank, support research organizations for the improvement of pharmacy and medicine. These organizations and their research staffs are capable, manned with scientists of the highest calibre, whose efforts deserve the fullest encouragement and recognition. But does not such research need the balance or supplement which comes from its counterpart in academic laboratories?

You will ask, "What is it, then, that you have in mind?" I would not for one minute think of curtailing research where it is already going on; in fact the more research along these lines that is carried out, the better situated we shall all be so far as matters of health are concerned. Rather I am wondering whether the entire advance of medicine is not going a bit lame because the leg of pharmacy is behind the other agencies. Is it not time that pharmacy as such assume more of the responsibility which it ought rightfully to share?

When we come to our institutions of pharmaceutical education we are confronted with a situation that, I think all will agree, permits of improvement. In this country there are, I believe, some eight schools of pharmacy which make any pretense of doing research. Think of it, eight schools where the professors get that self-stimulation and are able to inoculate the students with a contagious enthusiasm which can come only from original and fundamental investigation in one's specialty!

To be sure the training of future pharmacists is a serious and important task and under no circumstances should be abridged or hampered in any way. Too frequently do we

hear the complaint that the graduate school, especially the research professor, is encouraged at the expense of the undergraduate students. Yet, after all, when a student has been trained, even in our best schools, to the point where he receives his B. S. degree and is able to pass the "State Board", he has been brought no farther than the present stage of development and progress. If the gifted student wishes to apply himself in such a manner that he may take part in and contribute to further advances, what can he do? With very few exceptions he must go into the medical school where he may specialize in physiology, pharmacology, bacteriology, biology; or into the chemical laboratory; or he may take up clinical medicine.

Without in the least discouraging other workers in the medical and public health professions, is it inopportune to ask: "Shall not pharmacy take a more active part by assuming its share in research responsibility?" Will not progress in health measures be more rapid when pharmacy as such becomes more active and aggressive on its own account?

Are Delayed-Course Examinations Adaptable to Pharmaceutical Education?*

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For many years examinations were considered as having no other function than that of determining the qualifications of a person or persons in some particular subject. For this purpose, oral and written examinations were employed. Oral examinations permitted considerable variation of the type of questions asked and the subject matter covered. At the conclusion of such an examination, the examiner evaluated the answers given to the questions on the basis of general accomplishment, it being obviously impossible to rate the results of such oral examination according to some fixed scoring plan. Innumerable experiments have shown that where a half-dozen or more scorers evaluated the answers to questions asked by one examiner, there was always a wide

*Read before the Conference of Teachers of Chemistry, New York City, August 16, 1937.

variation in the ratings. In an attempt to standardize questions, the use of catechisms covering the fundamental and basic facts of particular subjects was favored by some teachers. The use of such catechisms determined only the factual knowledge of a student and not his ability to correlate and apply the information. Furthermore, the catechismal form of oral examinations standardized quizzing to such a degree as to preclude any inspirational value accruing from them. For these and other reasons the use of standardized questions has been largely discarded.

Written examinations, on the other hand, can be constructed so as to determine quite accurately both the amount of factual material acquired by a student during a course of study and also his capacity for correlating and applying the information. Examinations of a purely objective type were found to be better suited for determining the former whereas examinations of the essay or subjective type were more satisfactory for evaluating the latter. I believe it to be inevitable that the newer types of examinations or modifications of them will be adopted in all lines of educational work, however, the nature of the subject matter of a course will determine to a large extent their degree of adaptability. Let us assume that some written examination plan has been found to be satisfactory for evaluating a student's accomplishment in a particular subject. Even then we are confronted with the variations that occur in grading the examinations and we wonder what plus and minus limit should be established in order to make the final grade an equitable one. Some facts relative to variation in scoring examinations have been observed and these observations proven to be correct by experiment. Permit me to point out several of them: (1) An instructor in pharmaceutical chemistry has given an examination and has graded the paper 75. If this same paper is recopied and submitted to the instructor after a lapse of six months or longer, very seldom does the instructor arrive at the same numerical rating as before. (2) If this same examination is submitted to a number of different scorers, a variation of about ten per cent plus or minus from that scored by the instructor of the class will usually result. (3) If this examination is scored by the professor who delivers the lectures in the subject and also by his younger assistant, it has been observed that in the majority of in-

stances the grade given the paper by the assistant will be appreciably lower than that given it by the professor in charge of the class. (4) If the same examination is scored by two groups that vary markedly as to age, the results reported by the scorers of lesser teaching experience will be lower than those reported by the group of more mature years. If a year or so is allowed to elapse and the same examination submitted to the same two groups previously mentioned, it has been found that there is the same variation within the groups as noted under #1, but that the general average ratings of the two groups will remain about the same as they were before the period of time was allowed to elapse.

Because the importance and necessity of examinations in educational procedures have been recognized, many institutions have spent large sums of money and much time in the careful study of the entire subject in the hope that the quality and scope of examinations would be improved; that new techniques for the formulation of examinations would be devised; that newer types of examinations from which the answers to the questions would be more significant of the student's accomplishment would be developed; and a more uniform system of scoring examinations would be conceived. The results of these many investigations have been widely published and have led to many discussions of the related merits of objective and essay type examinations, scoring systems, percentile ratings, etc. Altho most educators acknowledge that some form of examination is necessary to our present educational system in order to determine student accomplishment, they have also recognized for some time that they may be used as agencies to stimulate interest and to coerce students into remembering and correlating important factual data. In no other field is it more important for a student to retain factual data and be able to correlate it than in the health sciences.

The first professional group to employ examinations as a stimulus to acquiring these desirable student-qualities was the medical group. In brief, it was felt that by delaying course examinations until the end of a school year, students would be forced to remember important subject matter acquired throughout the year and in order for them to do this, it would be necessary for them to review frequently. The so-called comprehensive or delayed-course examinations as

used at present are conducted on a purely impersonal basis. Each student is assigned a number. No names or other marks of identification appear on the papers. The examination must be written with a No. 2 pencil or blue-black ink, and the papers are distributed among the entire faculty for scoring. All the examinations are carefully proctored and any indication of obtaining information from others is considered to be *prima facie* evidence of dishonesty, for which the penalty is expulsion from the medical school. The great majority of the faculties employing these delayed-course examinations is of the opinion that the results obtained with this type of examination justify their continued use. A minority group in the faculties of schools of medicine is of the opinion that delayed-course examinations are so impersonal as to make inspirational instruction by and from them almost impossible. One of the strongest agencies for inspiring a student is the personal contact that he has with his instructor and if a student realizes he must stake all on his comprehensive examinations, he is interested primarily in passing them and not in getting to know his teacher personally. The personal factors in medical education are sacrificed almost entirely in order to obtain greater selectivity in the student body and also to higher standards of scholarship. Some are so caustic in their criticism of delayed-course examinations that they facetiously remark that "comprehensive" examinations should be called "reprehensive" examinations. In my opinion the value of personal contacts between student and instructor by virtue of which the former may be inspired in his study, should not be under-estimated. On the other hand, I believe delayed-course examinations that are conducted along purely impersonal lines not only offer the opportunity to the instructor for determining the accomplishment of a student but also act as a definite stimulus to the student to remember and correlate the subject matter presented in his course work throughout the year. I believe this would hold true in pharmaceutical education as well as in medical education.

Long before the adoption by the medical schools of the delayed-course examination system, many intensive studies of a large variety of course examinations were made. A comparison of the results from course examinations given both before and after these studies were made, clearly shows

that these investigations were very much worthwhile. Not until the quality and efficiency of their course examinations had been improved did the medical schools proceed with the next step in their examination-study program, viz., the adoption of delayed course examinations.

A number of instructional staffs of colleges of pharmacy are definitely in favor of the immediate adoption of this type of examination. Furthermore, a considerable number of members of state boards of pharmacy are favorably disposed toward them. It has even been suggested by some state board members that if the colleges would adopt comprehensive examinations at the end of each year and require the students to successfully pass these examinations before they could be promoted to the succeeding year, the state boards might be willing to accept these papers in lieu of their own theoretical examinations. It has also been pointed out that the state boards of pharmacy could go a step farther and establish their own degree of excellence upon these comprehensive examinations and exempt from the theoretical examinations on this basis. Furthermore, the greater number of exemptions from the theoretical part of their examination would permit more time to be devoted to the practical part of the state examinations, the results of which, in my opinion, are the best criteria for capacity to practice pharmacy.

I am not prepared at this time to suggest that the Association schools adopt a system of comprehensive or delayed-course examinations. For your information, I may state that at the University of Minnesota we are prepared to embark upon an investigation of our examinations and examination procedures and at its conclusion accept the opinions of experts in the field of education as to what plan is best adapted to our particular professional work. This study, specific to pharmacy, is only one of many continuation projects that have been considered desirable after six or seven years of intensive study of examinations by the Committee on Educational Research. During the coming year this Committee hopes to assign one or more graduate students in education to collect the necessary data in our College. These graduate students will formulate a vast number of questions prepared at the time the instructors are delivering their lectures. These questions will be submitted to an expert in the

field of education and he, together with the instructors in charge of the classes, will formulate the questions for the mid-quarter, final, and other examinations. After the revision and modernization of our course examinations by our instructional staff and these experts, we then plan to put into effect, in an experimental way, a comprehensive examination covering one year's work, probably either the freshman or the senior year. Even though the course examinations will still be given, the comprehensive examination will deal more specifically with the application and correlation of the factual data presented throughout the year. If this combination of course examinations as augmented by a comprehensive examination works out satisfactorily, we will then be in a position to determine whether or not the course examinations should be eliminated entirely and replaced by comprehensive examinations. In my opinion, comprehensive or delayed-course examinations are adaptable to pharmaceutical education but I believe we should not consider making this change without first making every effort to bring our present system of course examinations up to its maximum efficiency.

ABSTRACT OF DISCUSSION

At the conclusion of his paper, Dean Rogers explained that at the University of Minnesota the Committee on Educational Research has been studying examinations, that much time and money has been spent and volumes published but reading the conclusions "does not help the person vitally interested in improving his type of examinations in a particular college," so the Committee has been asked to make a specific study of examinations in pharmacy. From his own experience in preparing examinations, Dean Rogers is not certain that one type is a better index of a student's accomplishments than another.

Professor Stroup expressed the opinion that comprehensive examinations at the end of the senior year might result in graduates being better prepared for board examinations.

Details of administration and valuation of comprehensive examinations were discussed by Dr. Lynn, Professor Bergy and Dr. Klemme.

The Application of Objective Examinations In Elementary Organic Chemistry II*

CARL J. KLEMME and JAMES H. HUNTER

This paper is a sequel to the one given by us at the last meeting of this body and it was requested because of the amount of discussion which the first paper evoked.

The writers wish to emphasize, first of all, that any papers dealing with this subject are not attempts to convert anyone to the use of objective examinations. These examinations have their places but should be used properly, advisedly, and only when they give a better result than some other type of examination.

Perhaps the easiest way to present our conclusions regarding the use of objective examinations in elementary organic chemistry is to recount the advantages and disadvantages as they have appeared to us during the time that we have used this method of examining.

We may consider the advantages first, but it is difficult to separate some of the various advantages from one another because they are frequently interwoven. We believe without question that a well prepared objective examination is the most accurate measuring device of a student's knowledge and his ability to apply it. While we make this statement in general, there are unquestionably exceptions which will be pointed out under the disadvantages. It should be borne in mind that if the examination is to be an accurate measuring device it must involve the element of time as well as being a measure of factual knowledge and reasoning ability, since several students may make the same grade on an examination, yet one may require considerably more time to complete the work than another student. Obviously, the student who completes the work in the least time is the more capable from the standpoint of good memory and quick thinking and he therefore should rate higher than the slower student, even though the latter accomplishes the same task in a longer space of time.

Second, the objective examination can cover a much

*Read before the Conference of Teachers of Chemistry, New York City, August 16, 1937.

greater part of the field than the essay type of examination because the answers require merely a mark or perhaps a word. This must be regarded as important because many times a student will admit that he studied just the right thing for an essay examination, whereas some other time a majority of the questions may be such that he is unable to make a passing grade even though he has a relatively comprehensive knowledge of the subject. It is true that these are isolated cases as a general rule, but they should not be overlooked.

Third, the time required for the evaluation of the examinations is extremely short compared to that required for proper evaluation of essay examinations.

Fourth, the evaluation of objective examinations is free from subjective influences and this advantage contributes to the fact that they are more accurate measuring devices. Whether we are willing to admit it or not, we are prone to allow personal influences to enter into the evaluation of an essay type of examination where accurate grading is impossible. Moreover, we believe that any instructor in grading essay examinations, especially in cases where a large number is involved, is very apt to err in giving proper and consistent evaluation to discussions, and one student may receive more or less credit than another for discussions of approximately the same value.

Fifth, if the objective examinations are properly applied with respect to both student and instructor, they keep the objectives of the course constantly and clearly before the instructor. All too frequently instructors are liable to roam from the subject and, while these extraneous bits of information may be valuable and even instructive, they consume time which may prevent the proper completion of the subject matter. Such a criticism is a real one and not a figment of the imagination, for there are a large number of instructors who do not plan their work to the extent that their field will be properly covered in the allotted time.

Sixth, if objective examination questions are properly constructed, they can be applied in such a manner that they repeatedly bring before the student a large number of fundamental principles which should be retained by the student long after the course is over.

Seventh, again, if the questions are properly constructed,

they tend to develop a keen analytical reasoning on the part of the student. It might be noted that in our first paper on this subject we stated that there was a tendency of the students to memorize facts and to discount the importance of reasoning, but this observation arose from the fact that many of our questions were such that the student could answer them by amassing a considerable amount of factual knowledge. This has been remedied to a great extent by keeping the number of questions which can be answered by factual knowledge at a minimum and substituting questions which demand reasoning power on the part of the student.

Looking at the other side of the picture we have a number of more or less serious disadvantages to consider.

First, proper questions of the various types require extreme care in their construction. There can be no possibility of ambiguity if the question is to be valid and, actually, questions must be tested to determine their reliability and validity. It is very easy to fall into the trap of poorly worded or constructed questions which not only work a hardship on the student but fail to give the desired result from the examination. It would not be going too far to say that the failure of objective examinations in most cases is due primarily to faulty questions. Moreover, there is a great tendency to construct questions which test memory alone and, while these questions may be desirable to a limited extent, they should be avoided in general because questions which will determine the student's ability to apply facts can also be made to test for factual knowledge. We therefore believe that an instructor who attempts to use objective examinations should first make a thorough study of examination questions in general.

Second, due to the extreme care which must be exercised in the construction of objective tests, a great deal of time is consumed in their preparation and this considerably overbalances the time which may be saved in the evaluation of the tests. This is particularly true in the early stages of the application of objective examinations, at least until a very large number of valid and reliable questions has been accumulated. When this has been accomplished the instructor may draw upon this stock of questions for the preparation of an examination in a relatively short time, but the fact must not be overlooked that some

of these questions may be obsolete and new questions must be constructed continually, especially in any advancing field of science.

Third, one of the most serious disadvantages we have found thus far is the tendency of students to race against time. By so doing, they are prone to guess at many of the questions and avoid the processes of reasoning. To date we have not been able to solve this difficulty to our satisfaction; it is the one serious disadvantage for which there seems to be no remedy, at least at the present time.

Fourth, the short-answer type of examination does not allow the student to apply rhetoric, grammar, spelling, or verbal logic, all of which are necessary parts of the student's general education. Actually, while these things are taught in other courses, they should be applied wherever the student has an opportunity to use them. We might, for that matter, question this phase as a disadvantage because many instructors pay little or no attention to a student's English or verbal logic on examination papers.

Fifth, even though test questions may be carefully constructed, there is frequently a suggestiveness of statement which may lead the student directly to the answer and in a sense hinder the individual's development of initiative and reasoning.

Sixth, this type of examination, if strictly applied, does not allow the use of such excellent questions as developing syntheses, questions which call for a considerable amount of factual knowledge, ability to apply the facts and the development of steps in their logical sequence.

Our experience in the use of objective examinations has led us to believe that they may be satisfactorily applied to elementary organic chemistry to some extent; however, we do not care to rely entirely upon the short-answer type of test. It is our opinion that while objective examination questions serve to cover the field of elementary organic chemistry quite thoroughly, we feel that the addition of questions other than the objective type should yield a more desirable examination. We believe that although the complete essay type of question can be used to no particular advantage, those requiring brief, concise answers are valuable, particularly in avoiding some of the disadvantages of the short-answer type of question.

It is our opinion that the objective examination could be made especially useful in cases where the examining is done by outside agencies and in state board examinations. This, of course, pre-supposes that both presentation of subject matter and construction of examinations would be based upon a set of objectives agreed to by both college and examining agency.

If any members of this Section are interested in some of the questions which we have applied during the past two years, we will be glad to furnish them upon defrayal of the moderate expense of their reproduction.

ABSTRACT OF DISCUSSION

Asked whether the deduction of wrong answers from the number of right answers is a deterrent to guessing, Dr. Klemme replied that even after their deduction of twice the value of the question students continued to guess.

The Teaching of Nonofficial Remedies*

P. A. FOOTE

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The term nonofficial in this title is used in a literal sense to cover all preparations made by manufacturers and sold under coined names. They are often referred to as specialties, proprietaries, patent medicines, if advertised to the public, and those that are accepted by the Council of Pharmacy and Chemistry of the American Medical Association are, of course, called New and Nonofficial Remedies. In this paper the scope is wider than the latter standard.

THE NEED FOR SUCH A COURSE

Is there a need for such a course? Some figures from the St. Louis Survey will help. "Of the 1186 different items necessary to fill the professional store prescriptions 45 per cent or 533 would have to be specialties." This survey also points out that "the major part of the pharmacist's inventory problem in the prescription department is due to the many specialties which are prescribed only once or a few times a year." Further in the report it is noted "*that only 13.4 per*

*Read before Conference of Teachers of Pharmacy, New York City, August 16, 1937.

cent of the proprietaries marketed are prescribed." It must then follow that 86.6 per cent of the proprietaries on the market reach the patient by other means than the prescription. This is usually over the counter. Hospital and physician dispensing will also account for some. It would then appear that more than half of our modern materia comes under the class which must be handled by a majority of our graduates in pharmacy for most of them enter retail stores. If this information is not given to them in college they will find themselves handicapped in the drug store until this knowledge is acquired by self application and experience. Meanwhile, both the employer and the young graduate must be patient.

Whether the present United States Pharmacopœia and National Formulary propaganda will mitigate the situation remains to be seen. It will surely meet strong opposition for "specialties" is the life blood of many of our pharmaceutical houses. Even the essential oil firms have gone in for specialties in perfumes, flavors and colors. One house organ recently devoted the first page to lauding the research efforts of manufacturers. It pointed out that over 12 per cent of the monographs of the United States Pharmacopœia XI describe products which were first developed and introduced into medicine by the manufacturers of medicinal products. The size of many detail organizations is being increased. One large specialty house is doubling its detail force over a three year period.

Is there a place in the four year curriculum for such a course? The writer believes there is, not alone because of the above facts but because of further benefits, several of which we might enumerate:

1. For the graduate who goes into detail work, such a course, if properly organized, will give him a well balanced picture of the field. If the history of many companies has been given in the course, as it is at the University of Florida, he will know his competitors much better.

2. In a similar manner such a course will be of assistance to a pharmacist if he desires to compete with detail men in United States Pharmacopœia and National Formulary propaganda work. Of course, this raises the question as to whether it is feasible to bring this out in this course and, if so, how

much time should be spent on it? It is one of the purposes of this paper to raise a discussion about such points.

3. A course in nonofficial remedies will assist a graduate who enters a hospital pharmacy. It will assist him in buying and advising the medical staff about current remedies. It will further assist him in developing a hospital formulary if he is called on to do so. The writer could illustrate with actual cases but space will not permit.

4. For the graduate who goes into medicine or dentistry pharmacy is supposed to offer an excellent background. A course in nonofficial remedies will broaden his knowledge of modern *materia medica* and he will see it in its true light before the detail man calls on him.

5. The graduate who enters either a commercial analytical or a formula development laboratory will have worth while knowledge to draw on concerning the nonofficial remedies which he will meet.

6. The graduate who plans to open a store of his own will have a knowledge of the nonofficial remedies which he must stock and the relative demand for each.

7. The material for teaching such a course is a valuable asset to the college in many other ways. It consists essentially of stock packages, catalogs, price lists, and the manufacturers' descriptive literature and house organs. This can be made the nucleus for a model drug store; although I believe a better start toward such is in the campus dispensary. The drugs are on hand for emergency calls from druggists and physicians. Such an emergency call may not be for stock along but, in the writer's experience, for quick information on ingredients to assist physicians in poison and idiosyncrasy cases. If the ingredients are not reported in the literature perhaps the one suspected can be quickly tested for. The literature is a ready source of information for pharmacists and physicians. The St. Louis Survey pointed out that it seemed difficult for the pharmacist to get this. If it is kept up to date it gets quite voluminous and is regarded as too big a task by the average pharmacist. The writer knows of one prescription pharmacy which hires a high school boy three hours a day for the purpose of filing literature. I might add that the owner assigns to each of his pharmacists certain groups of nonofficial remedies for them to keep posted on so that telephone inquiries about them can be

answered almost immediately. It should also be mentioned that such literature is not infrequently of value to graduate students as well as to students in other courses who are preparing topics.

THE PRESENT OFFERING OF THE COLLEGES

Having pointed out the reasons for such a course let us see what the colleges in the Association have done about it. The recent catalogs of the member colleges were consulted. According to the description of courses but fourteen of the colleges offer any kind of instruction in this field and only ten offer distinct courses in the subject. The least that appears to be done is to exhibit such a collection of remedies and allow the students to use their own initiative in seeking more information. The most that appears to be done is in the writer's own course offering a total of eight semester credit hours. Between these two extremes we find that a portion of this information is given to students in such courses as inorganic and organic pharmaceutical chemistry or materia medica. Five colleges call their course New and Nonofficial Remedies, two call it New Remedies, one Proprietary Remedies, one Proprietary Preparations followed by a course in New and Nonofficial Remedies, and one calls it Prescription Problems of New and Nonofficial Remedies. Three colleges use New and Nonofficial Remedies as a text while three more of them state that New and Nonofficial Remedies is used but supplemented by other material such as manufacturers' reports and current pharmaceutical literature. The other four colleges do not state if such a guide is used. One member college offers a course in sick room appliances but evidently none in nonofficial remedies. Only once is Accepted Dental Remedies mentioned. The majority of colleges giving courses in this field offer a two semester hour (or equivalent) course which is generally required. Most of the courses come in the third and fourth years. The writer believes that the fourth year is the ideal place for it because the student has acquired sufficient fundamental knowledge to readily appreciate what science there is in the preparation and what its proper position is in our modern materia medica.

THE SCOPE OF THE COURSE

The scope of such a course must be broader than New and Nonofficial Remedies if it is going to be as practical as possible. It must include items that the graduates are going to handle in the store regardless of therapeutic value and regardless of whether they are accepted by the Council. Such a list must then include old remedies as well as nostrums. Turnover must be the chief criterion. To discuss the items in New and Nonofficial Remedies alone would include items that are rarely if ever stocked in a drug store. Some of them are essentially hospital items or else have little sale. Does an instructor turn to such a source because he thinks it is ethical and he must follow some standard according to the old procedure of following the U. S. P. and N. F. or because it is too much work to make up his own list? At the University of Florida we have adopted the policy of satisfying all to give the student the most. The items discussed in the course are chosen by the following methods:

1. Turnover as reported to us by the largest wholesale drug firm operating over the entire state and checked by the owners of several leading stores. This should be done annually. District managers of this company are of the opinion that this will not vary more than 5 per cent in various sections of the state. Such a list will show seasonal variations as well as variations due to promotional campaigns. It cannot be used in other sections of the country. If it could then one might use the list of specialties in the St. Louis Survey. This is, however, very helpful and the students should use it. Several copies are available to them in our departmental library. It is obvious that the turnover will vary in different sections of the United States. To satisfy myself of this I checked with a couple of stores in central New York State and found it to be true. A list of fast turnover items is apt to include so-called nostrums. Shall they be included, and if so, what can be said for them? I believe they should. The students can familiarize themselves with the package and literature and can be referred to the publications of the American Medical Association for their findings. The class is advised that all items in the course are not therapeutically efficient and are included from the standpoint of demand, which is a policy similar to that of the National Formulary.

2. Council Accepted items, at least those which are described in New and Nonofficial Remedies, if they are not taken up in other courses as is the case with the biologicals at the University of Florida. If sufficient time is at hand all the items might be included whether they are popular or not. This presents the medical viewpoint.

3. The leading specialties of our well established manufacturers or importers. Many of these have merit. Perhaps they never will be accepted by the Council because all the rules are not complied with. On the other hand maybe the manufacturer does not want them accepted and never submits them for approval. An example is the case of a well known large company which markets only high class products. This company would not allow some of their preparations to be discriminated against by the acceptance of only a portion of them. Their attitude is that the Council must accept all of them or none at all. Practically all of the manufacturers are glad to supply stock packages and descriptive literature for this purpose. Dummy packages may be used for very expensive drugs but the general use of them is not advised. The student should see, handle, smell and perhaps taste the drug. In this connection the manufacturer's local representative is of immense help. His friendship should be cultivated. Periodic visits by him should be encouraged for purposes of getting information on new products. This in turn can be passed on to the students.

ORGANIZATION OF THE COURSE AT THE UNIVERSITY OF FLORIDA

The School of Pharmacy at the University of Florida has approximately twelve hundred different products consisting of nonofficial remedies, biological and gland products. About six hundred are studied during the year in the course now being discussed. This might seem like a large number but the duplication or similarity of items by different manufacturers decreases the amount of material which the student must study. Vitamin products as well as barbiturates illustrate the point. All of the products have been donated by more than one hundred different manufacturers and distributors. Most of them send descriptive literature and reprints of research for the files. Often enough literature and physicians samples are included for class distribution. The

student is urged to keep this literature as a nucleus for such a file to be continued in the drug store after graduation. An alphabetical arrangement of this appears to be the best.

For purposes of study the remedies are grouped according to the chemical classification used in New and Nonofficial Remedies. To this is added a miscellaneous group with an alphabetical subclassification. The ideal way to store these products when not in use is of course in the model drug store. Without this at the University of Florida we use a Schwartz cabinet and display cases in the class rooms and hall. The remedies are stored in this same classification so they can be easily removed for study. Many manufacturers send us new items as soon as they are put on the market. They are immediately put on display in the hall. A recent case is Prontylin and Prontosil which was on display weeks before they were available in the local drug stores. Had a local physician known this he could have saved a special aeroplane trip to get the latter for an emergency case. Our students already had knowledge of these drugs when popular press articles began to appear. They could go back home and discuss them with pharmacists and physicians leaving the impression that they were attending a school of pharmacy that kept up to date. Is not this an inspiration for them to do likewise after graduation?

Three different card indexes are kept referring to all remedies on hand: (1) by the New and Nonofficial Remedies classification for study; (2) alphabetical for quick finding; (3) by manufacturers, to see at a glance what items we have from each company which is of great advantage in corresponding with them and interviewing their representatives. The cards are 5x8 and printed by the University duplicating department in the following form which is filled in for illustration. The rectangle in the upper right hand corner contains the classification number.

THIO-BISMOL NNR 1935 Mfr. Park, Davis & Co.

12

SYNONYMS:

Sodium bismuth thioglycollate

STRUCTURE & COMPOSITION:

$\text{Bi}(\text{SCH}_2\text{CO}_2\text{Na})_3$. Approximately 38% Bi.

CHEMICAL PROPERTIES:

A canary yellow hygroscopic noncrystalline but granular substance possessing a garlic like odor.

Freely soluble in water. Solutions not stable.

ACTION & USES:

For systemic effects of bismuth in syphilis. It is of particular value in arsenic-fast and mercury-fast cases, in neurosyphilis, in persons hypersensitive to arsenic and mercury, and in cases in which an acute flare-up is to be avoided.

ADMINISTRATION:

Usual dose 0.2 Gm. deep intramuscular injection twice a week for 10 or 12 doses.

HOW SUPPLIED & PRICE:

*In boxes of one dozen 2-cc ampoules (0.2 Gm. in each)
—per box \$ 3.75
In boxes of one hundred 2-cc ampoules (")
—per box \$25.00

Each box contains a vial of sterilized distilled water.

REMARKS:

It is tissue-fluid-soluble. Absorbed within two hours. Does not ppt. serum or form insoluble albuminate compounds at site injection.

This size was chosen as being not only convenient to handle but also allowing space on the back for additional comments and references to literature. The students buy the cards and fill them in to make up their own file. This is an excellent beginning which may be continued in the store after graduation. Some of the companies print smaller cards containing much of this information. Some of the drug journals give it in condensed form to be cut out. These cards or clippings may be attached to the original card.

At present this course is offered as a four semester hour course for two semesters, a total of eight semester hours. It is elective to seniors. The first semester is not a prerequisite to the second. After eight years we have found it so beneficial to our graduates that the faculty has voted to require it for graduation. The course has received many favorable comments from druggists throughout the state as well as from recent graduates. Some of them continue their interest by sending in literature for the files. Beginning in September, 1938 this will be a three semester hour course for two semesters consisting of two didactic and three laboratory hours per week. The laboratory work is given over to (a) classifying and filing the remedies and literature; (2) handling and studying the preparations, catalogs and literature and completing the information on cards, each student being assigned to a separate group of preparations; (c) su-

*In Stock.

pervised library work in the departmental and main libraries. Student reports so worked up are presented by them in class for the benefit of the other members. The students are held for the principal information on the cards as well as the general pharmacological and pharmaceutical aspects of each classification. They are not required to remember prices. It is too much detail to hold them for; furthermore, prices are continually changing. Wholesale and suggested retail prices are given in lecture. The former is entered on the cards. The students will then have a knowledge of the approximate value of the items. Company representatives are frequently invited to talk before the class not only concerning their products but also about the nature of their work. The students buy and use New and Nonofficial Remedies. In this connection such points are discussed as the history, policies and organization of the American Medical Association as well as the organization and rules of the Council of Pharmacy and Chemistry.

Some of the lectures are on the history and development of pharmaceutical manufacturing in the United States. The rise and growth of the leading pharmaceutical houses is discussed. This is not only inspirational to the students but gives them a good knowledge of the concerns they will deal with. This kind of information is not easy to acquire but the writer has been accumulating it for years. Visits to many plants in the United States and Europe have helped him. One large company had never organized these facts until they were asked for. The writer has to thank Dr. Edward Kremers for arousing his interest in this subject. Caution must guard enthusiasm along this line so as not to glorify the manufacturer at the expense of the retailer. Is not the retail pharmacist the one to be lauded? The specialty situation has been forced on him. Is it not being forced on the colleges of pharmacy?

ABSTRACT OF DISCUSSION

Dr. Alexander asked if this sort of information is not out of date almost as soon as compiled and Dr. Foote replied that he had been told that the average life of a proprietary is seven years, that the items in a course like this must be checked at least every two years. One of the valuable results of such a course is that it sets up standards for selection of material, sources for keeping it up and technique of keeping it up.

Dr. Harris saw no reason why official and unofficial compounds

cannot be taught in the same course in organic chemistry; there are some definite objections to separating the material. Certain unofficial preparations differ from official ones in no essential particular aside from having certain patent rights.

Dr. Foote granted that, wherever possible, relationships existing between official and unofficial compounds should be shown in the general course but time is insufficient to cover the number of items included in the separate course.

Dr. Hammond asked Dr. Foote if much of the information collected in his course is not contained in Gutman's Drug Encyclopedia and Therapeutic Guide. Use of such a book in dispensing courses reduces the time required in obtaining information. In reply, Dr. Foote stated that putting the library work into his course helped to teach students that they cannot rely on one text book and that they should go to the original sources.

Professor Bowers said he felt that teachers need to guard against assignments that require too much time in library work and to avoid over-emphasis on factual information rather than training in fundamental principles. At the University of Southern California a course in the literature of pharmacy is offered, in which students are taught how to use the library.

Recruiting for the Profession of Pharmacy

B. V. CHRISTENSEN

School of Pharmacy, University of Florida

Every profession is accepted at its own evaluation and no profession can be evaluated more highly than the personalities of its membership. Before we as pharmacists can prove our worth to the outside world we must prove our worth to ourselves. We can not expect from society that respect and confidence which we feel a profession should have until we have respect and confidence within the profession. We must recognize also that there are innate attributes which the personnel of our profession must possess to prove even to ourselves that we are worthy of that respect and confidence. Does meeting legal requirements alone prove to ourselves that the public should place in us that implicit confidence which pharmacy traditionally deserves? It appears, therefore, that what pharmacy needs is careful introspection followed by action. Our primary hope is to build for the future and the foundation is within our youth of today. This means that we must carefully select only those of our youth who possess the attributes which are deemed essential for this profession.

In "Basic Material for a Pharmaceutical Curriculum" it is pointed out that one of the important duties of a pharmacist is "to recruit young men of character for the profession." It is evident that this indicates that every pharmacist should be interested not only in the perpetuation of the profession but in the progress and improvement of the profession.

This is a charge to every pharmacist and it is a charge filled with deep significance. It is a charge not only filled with deep significance but with broad significance. It is a charge the full import of which can not be realized in a moment. It is one of those things that grows and enlarges and sends out strands and tentacles that grip in many directions. Is this, therefore, not worthy of careful study and consideration?

Pharmaceutical educators should be vitally interested in this because they not only recruit but prepare young men for this profession. Board members should also be just as vitally interested because as board members they must examine the product of the colleges and admit them to practice, that is, they must pass on the job of the educator and either approve or disapprove. The practical pharmacist should be interested because after the colleges have graduated these prospective recruits and the boards have placed the stamp of approval on them, the practical pharmacist takes them in his pharmacy and polishes them off to varying degrees of satisfaction and practical efficiency. The general public should be deeply concerned because it is these same recruits that the public must look to for a safe and satisfactory pharmaceutical service. Consequently, it is evident that "Recruiting for the Profession of Pharmacy" is a problem which extends down into the very roots of society and covers the length and breadth of the United States.

While this problem of selection of recruits for the profession of pharmacy could be considered from several angles it is evident that there are two aspects which are of extreme importance, namely, *character* and *ability*. It is these two qualities which are considered herewith.

You will note that in the statement of this duty of the practicing pharmacist that young men of *character* are to be sought for this profession. While it is difficult to exactly define character, nevertheless, I believe most of us have a

general understanding of its implications at least. Most of us probably would agree that character includes such attributes as honesty, truthfulness, sobriety, integrity, accuracy and even neatness and cleanliness. However, is it not possible that an individual could possess all of those attributes and still be only neutral in character? Consequently, does not character imply in addition to the above qualities a definitely positive quality, that is, that these qualities are not only possessed but that they are radiated? Does it not imply that these attributes are a part of the very nature of the individual and that they are not only a part of the individual but are promulgated as well? How important is character and in what position should it rank in the list of requisites of a professional man or woman?

Many colleges list as a prerequisite for entrance "good moral character". Many colleges also list "good moral character" as a condition for graduation and even as a requirement for continuation on the colleges rolls. State pharmacy laws include moral character as a requirement for certification as a registered pharmacist. State laws also provide that a breach of character may be considered a just cause for revocation of license to practice pharmacy. It is plainly evident, therefore, that character is generally recognized and considered an essential attribute of the pharmacist.

In this connection, therefore, it appears there is another very important aspect to be considered. How can character be determined? How can colleges determine the character of applicants for admission? How can boards determine the character of applicants for registration? Should boards expect the pharmacist preceptor of the candidate for registration to certify to the character of the candidate as well as length of experience? Should boards expect the colleges to certify to the character of the applicant as well as education? It is evident that it is difficult for colleges and state boards to get reliable information concerning the character of applicants. How seriously do colleges and boards consider this requirement and how much emphasis is placed on this attribute? What methods are followed to determine character? It has been suggested that prospective pharmacy students be required to take a series of predictive tests to include questions which would examine an individual's *knowledge* of ethics and thus serve as an indication as to the in-

dividual's point of view and thus indicate to some extent his character.

If boards find it impossible to emphasize this requirement, should the colleges assume the primary responsibility in determining the character of the student while he is in college? Should the colleges assume this responsibility to the extent of refusing to graduate students who do not possess the attributes of character considered essential? How can colleges determine the characters of students?

In recruiting for the profession it is essential not only to select young men of character but young men of *ability* as well. The student should have the abilities necessary for a successful pharmacist. He should be adapted by disposition and ability to satisfactorily master the fundamental and professional knowledge required and to profit by the educational process deemed essential. Pharmacy is based on the three fundamental sciences of biology, botany and chemistry. Hence, successful students of pharmacy must possess aptitude and ability for the natural sciences. How can we determine whether or not an applicant for admission to a college possesses the abilities mentioned?

If there are no means according to which it may be determined whether an applicant for admission to college has the desired ability, is it possible for the colleges to do this early enough and intelligently enough in the college course to prevent injustice to individuals? If it can be done, how is it to be done?

If the colleges find it impossible to make careful selections on the basis of ability and adaptation for the profession, can this be done by the boards? Whose responsibility is it? Is it a responsibility of anyone?

What about the responsibility of the pharmacist who takes the recruit into his pharmacy to give him practical experience? Does he have any responsibility in judging character and ability? Should he be expected to certify to character and ability as well as length of experience?

As a basis for discussion in connection with the responsibilities of a pharmacist toward the recruit it might be advisable to summarize briefly the three plans which are now in operation in various states pertaining to practical experience as a prerequisite for registration.

The first plan is the one which has been in operation for

many years and grants recognition to drug store experience obtained at any time previous to the examination and in any type of drug store as long as the experience is gained under the direction of a registered pharmacist. As is well known, there has been some dissatisfaction and some criticism of this plan. The claim has been made that a recruit may obtain all of his experience in non-professional aspects of the drug store and thus has gained little, if any, practical professional experience. It has been suggested that drug stores, therefore, be classified and that only such pharmacies as will provide the essential professional experience be recognized as meeting the requirements of the state board. This plan has also been criticised for the reason that in many cases the pharmacist in charge does not seem to feel that he should be regarded as a teacher and, therefore, takes little or no interest in attempting to serve as a preceptor to the apprentice. It has been claimed that in many cases the pharmacist is more interested in results as measured by cash receipts than he is in inculcating in the apprentice a professional and ethical interest and attitude. Since this is the plan which is still in practice in most states would it not be pertinent to bring up the question as to how much responsibility the pharmacist could be expected to assume with reference to instruction and guidance of the apprentice, and to what extent might state boards look to the pharmacist for assistance and advice in evaluation of the professional attitude, moral character and ability of the recruit when an applicant for registration?

Second, because of the lack of uniformity of experience obtained by recruits according to the first plan it has been suggested that colleges of pharmacy also provide facilities for gaining practical experience in the professional aspects by establishing campus dispensing departments. While this has been done by a number of colleges, state boards apparently have been reluctant to recognize this type of experience as equivalent to that obtained in the drug store. Should state boards accept this kind of apprenticeship it would place the responsibility for judging character, ability and professional attitude on the colleges. Would this prove more satisfactory than the first plan? Could the judgment of college authorities be considered as reliable and dependable as that of the practicing pharmacist? Would there be greater

uniformity in the type of experience gained by the recruit in the college dispensary and could it be made as practical in nature as that gained in the average drug store?

The third plan, while it has been under discussion for several years in a general way, has only recently been inaugurated in a single state. This plan provides for a system of drug store internship and provides that one year of practical experience must be obtained subsequent to graduation from college in a pharmacy approved by the state board for such purpose. This plan, therefore, places upon the state board the responsibility of selecting the approved pharmacies in which the recruit may gain acceptable practical experience which will satisfy the requirements of the state board. The board of this state has provided regulations which make it necessary for both the pharmacist, who is considered to be the perceptor, and the pharmacy interne to keep an accurate record of the internship to be presented to the board and supported by affidavit of both pharmacist and interne. In addition the board has prescribed the type of training contemplated by this law and has made it incumbent upon both the "master and apprentice" to regard their responsibilities with an appreciation of their obligations to the profession, to the public which both must serve, and to each other. The pharmacists selected by the state board are also required to signify their willingness to cooperate with the board of pharmacy in developing this type of training and to report to the board from time to time on the progress and *aptitude* of any interne under their supervision. Hence, it is evident that according to this plan the board of pharmacy takes the position that it is a definite responsibility of the pharmacist to offer instruction of a professional nature and of professional value to the interne. It is also his responsibility to judge whether or not the interne could be considered a desirable recruit to the profession of pharmacy. How successful this plan will prove to be remains to be seen.

In a discussion of the points previously raised it might be well to consider briefly this question. In determining the aptitude and adaptability of a recruit for the profession of pharmacy, who is entitled to primary consideration—the recruit as an individual or the society which he is to serve? In discussions of many similar problems in the past it ap-

pears that the emphasis has been placed upon the individual. It has been noted many times that there seems to have been a great deal of emotional sentiment expressed with reference to giving the "poor boy" an opportunity. Has this not been over-emphasized and as a result have we not permitted too many "poor boys", not poor in finances but poor in ability, character, and professional attitude, to enter the profession of pharmacy? On the other hand, is it not true that many boys poor from a financial standpoint but with plenty of ability, determination and ambition have surmounted all difficulties in securing adequate preparation and must be considered not only a credit to themselves but a credit to the profession? Should we not, therefore, consider these questions primarily from the standpoint of the profession of pharmacy in general and the welfare of the society that is to be served by this profession rather than from the standpoint of a particular individual concerned? Can we deny that we have been careless and even indifferent in regard to the character as well as the ability of those admitted to the practice of pharmacy? Can we deny that the good name of pharmacy has been capitalized upon by undesirable individuals and groups concerned only with material gains and personal profits? If pharmacy is to properly discharge its responsibility for dependable health service to the public, is it not imperative that we more carefully select those who are admitted to its ranks? If pharmacy is to protect and safeguard its good name for proper character and type of service, must we not more carefully define the attributes of character and arrive at a fuller realization of our responsibilities in the careful selection of our membership? If pharmacy is to be accepted at its true professional worth, is it not essential that we recruit young men of character to the profession?

---And How Much Time to Prescriptions?*

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Budgets are a very necessary evil, but an evil, nevertheless. I do not know who started them, but they will probably

*Read before the Conference of Teachers of Pharmacy, New York City, August 16, 1937.

be with us so long as we try to make a limited amount of money, time, or any other commodity, satisfy a demand for which the supply is not entirely adequate.

We are given a limited amount of time to educate a pharmacist, ordinarily four school years, during which period we are entitled, according to the Pharmaceutical Syllabus, to a minimum of 3000 clock hours in class room and laboratory. At the end of this training, the world expects that we shall turn out that paragon of intelligence, industry, honesty, sobriety, good judgment, and business acumen, known as a pharmacist.

This calls for some very careful budgeting. If 3000 hours of instruction is to convert that callow high-school boy into the finished, polished efficient product expected, then every hour must count.

Ideally, there should be no college curricula, but each student's education should be tailor-made. This would be true, even if it were desired to convert all of them into identical educational products, since they differ in previous training and in aptitudes. But when they are being trained for different types of pharmaceutical positions, or for the same position in different types of drug stores, the necessity for considerable flexibility in a curriculum becomes even more obvious. The National Pharmaceutical Syllabus Committee has recognized the necessity for this flexibility, and hence they set up only 2300 hours of required subject matter out of the total 3000.

The question, or questions, under discussion are: how much of this time should be given to prescriptions, or dispensing pharmacy, and of this, how much should be devoted specifically to incompatibilities? At this point, the question of definition becomes imperative. The term "prescriptions" or "prescription practice" has been used in catalogs to indicate anything and everything from the most elementary galenical preparations, made during the freshman year, to the advanced work in dispensing, during the latter part of the senior year. There seems to be no uniformity whatever in the use of the term. Moreover, the course in prescriptions is often made to include part or all of the required subjects listed in the Syllabus as pharmaceutical jurisprudence, Latin of pharmacy, public health studies, as well as some optional subjects. Obviously, then, the amount of time devoted to

prescriptions will properly depend upon the inclusiveness of the term.

For the purpose of this discussion, let us eliminate jurisprudence, Latin, and other subjects, considering them as subjects separate and apart from prescriptions. Similarly let us assume that the student has already completed courses in operative pharmacy, manufacturing pharmacy, and other courses in technique, so that he has actually made in the laboratory between one hundred and two hundred galenical preparations. Then how much additional time should be devoted to actual prescriptions,—to dispensing pharmacy?

Obviously there should be a certain minimum time, required of all who are to receive a degree in pharmacy and who expect to become licentiates. In addition, opportunity should be offered for further instruction for those who expect to specialize in this type of work,—who expect to be employed in strictly prescription pharmacies, or to devote all their time to prescription practice. The Syllabus has set 192 hours as the above minimum, one-third of which should be didactic instruction, and two-thirds actual laboratory practice. Is this sufficient? Or is it too much?

The Syllabus Committee expects a certain amount of duplication or overlapping of this work with that of other courses. This small amount of duplication may be regarded as both inevitable and desirable, but any great amount would reflect inefficiency in organization. It is my opinion, based upon 16 years of teaching pharmacy, that, if adequate instruction is given in subjects prerequisite to prescriptions, particularly in operative pharmacy, then the 192 hours required by the Syllabus in dispensing pharmacy, is an entirely adequate minimum. This is on the assumption that the work in prescriptions will come in the fourth year, preceded by general, organic, and analytical chemistry, by Latin, by physiology, and by pharmacognosy, and further, that jurisprudence and pharmacology will be prerequisite or corequisite courses. This makes of prescriptions a kind of crowning, or culminating subject, which it should be. Despite all the stale drug store jokes, and the unfavorable public opinion of pharmacy found in some circles, the Charters Report indicates that over 80% of all prescriptions received are of such nature as to require at least a modicum of specialized skill in compounding. We all know that a certain small per-

centage of them are quite difficult to compound correctly, and that a few of them are impossible.

This brings up the question,—how much time should be given to incompatibilities. It has been argued that, since prescriptions, as stated by Delgado, represent only about 20 per cent of the total revenue of the drug store, and since incompatibilities occur in only a very small percentage of all prescriptions, then the subject of prescription incompatibilities should receive no more than passing notice. This very logical argument can hardly be accepted as valid. It is on a plane with that of the man who discontinued his fire insurance after twenty years, because he had never had a fire. I feel that from one-third to one-half of the total time of instruction in prescriptions may well be devoted to incompatibilities. A prescription incompatibility is an emergency, and pharmacists should be trained to meet reasonable emergencies. The average pharmacist in America need not be trained to meet such emergencies as the reading of prescriptions written in Hungarian, but when he encounters such emergencies as a prescription with a strychnine dose of half a grain, or a prescription containing potassium iodide together with sodium perborate, he must know exactly what to do. In meeting these emergencies the student is called upon to exercise his knowledge of chemistry, of posology, of operative pharmacy, and of all other courses he has had in four years. Dr. Husa in his text on pharmacy, reminds us that if the 500 ingredients that enter most often into prescriptions be taken alone or in combinations of two, three, four or five, the number of such combinations possible reaches the enormous total of 257,838,552,475. Even this does not represent all possible incompatibilities, but only those independent of any quantitative relationships. A student cannot, therefore, memorize all possible incompatible combinations, but must familiarize himself with certain very general principles in chemistry and in pharmacy, and apply these principles to such incompatibilities as he may encounter. The study of incompatibilities, is, therefore, the application,—the proving ground of four years of education. Just as a manual worker must have both sharp tools and a trained hand, even so must the pharmacist have a thorough basic knowledge of his fundamental courses together with the ability to apply that knowledge to prescription difficulties.

Finally the expert filling of prescriptions is the truly professional part of pharmacy. The old-time manufacturing in the retail pharmacy was highly professional, but most of that belongs to the past. We now buy fluidextracts and tinctures. The cosmetic department and the lunch counter may be more lucrative than the prescription counter, but the law does not require four years of college education before you recommend cold creams or sell sandwiches. The opinion prevails among the public, generally, that when the old-time preparation of tinctures, fluidextracts and infusions in the drug store was discarded, we thereby lost most of our professional habiliments, leaving us no more than a barrel, representing our prescription practice. It might prove rather embarrassing if we now started kicking any staves out of the barrel.

ABSTRACT OF DISCUSSION

There was some discussion about details of procedure in dispensing courses. In answer to a question about teaching the incompatibilities in connection with the large number of organic compounds now in use, Dean Newton expressed the opinion that qualitative organic chemistry should be taught as thoroughly as qualitative inorganic chemistry.

Dr. Husa said he had found that more and better classification of organic compounds is helpful. General facts can be arrived at if compounds are well classified.

English for Pharmacists

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The recent paper of Mrs. Adelaide Harris on English for Pharmacists¹ was, as Dr. Lyman noted in his editorial remarks, "brimming full of ideas as to the possibilities and methods of rectifying this deplorable English situation in our schools". Though no such claim is advanced for the succeeding paper, it is hoped that a description of the ideals and practices at Fordham University's College of Pharmacy will supplement and lend strength to the suggestions already offered.

Fordham can perhaps be said to have the advantage over other colleges as regards the teaching of English to

¹A. J. P. E. Vol. I, page 348.

candidates for the bachelor's degree, since Fordham offered a four-year course in Pharmacy long before it became obligatory by State law. The English course was inaugurated in 1929, which means we have behind us eight years of experience which, though not great in itself, represents some advantage over those schools of pharmacy beginning the curriculum at a later date.

Besides this experience, which we hope will be useful to others, Fordham enjoys other advantages, again not great in themselves, but worthy of mention in the aggregate.

All courses in English, as well as those in modern languages, are given in the college itself. Though too much cannot be made of this point, the taking of art courses in the same building where scientific courses are given tends to establish in the minds of students a true connection between pursuits too often divorced. At least it eliminates the possibility of students' thinking, as they rush from one building or one department of the university to another, that they are subjected to art courses merely to fill in idle hours of their schedule. English and French or German are made to flourish in company with chemistry, biology and pharmacy—and at least a superficial brotherhood is implied.

Fordham is not hampered by an elective system. All courses in English are prescribed for two years, and all students receive the same instruction. By this arrangement a thoroughness of training and proper balance of courses are assured.

All courses in English at Fordham are conducted by one man. I have the pleasure of meeting students for two consecutive years of English, and after that for two years of modern language. It is scarcely necessary to point out that in the course of two years one becomes very well acquainted with the individual student, and that such close acquaintance makes it possible to give really helpful personal assistance. Though modern language is apart from present discussion, it may be stated here that I have found its teaching a great asset to the teaching of English. It is possible to compare modes of expression in the two languages, and by so doing to encourage precision in both.

The great advantage of having the same class for two years, however, lies in the fact that it is possible to correlate the various branches of English and to give the whole course

a oneness often destroyed when two teachers, with necessarily different techniques, share the work. It is possible, under such a system, to continue with each student in the second year a determined attack on faults made apparent in the first. It is possible to note progress, and, what is more important, to commend it. It is possible to establish partnership against a common foe, whatever that foe may be in the individual case. It is possible to impart enthusiasms, to transmit one's own love of good literature, one's own desire for clear and forceful personal expression.

The English course at Fordham is planned for a two-year period and is given in consecutive years. It is thought that two consecutive years, closely knit and as complete as possible without sacrificing thoroughness, will be more beneficial to the class than one year now and another later. The continuity can easily be broken by the intervening period, and at any rate is restored with difficulty.

The freshman course, like most freshman courses, is concerned primarily with self-expression. The student, with individual guidance and a minimum of precept, is taught first of all to respect the written word as the true mirror of one's mind, and to distinguish the written word from the language of ordinary conversation. He is taught that literature in general, and his own productions in particular, are "a thinking out into language"; that his words upon paper are an index, not only to his artistry in assembling them, but to his way of thinking, his whole intellectual makeup.

To obviate any false suspicions that composition is an academic pursuit, quite divorced from dispensing pharmacy or life in general, no textbook for composition is used in the freshman class. Each student provides himself with a notebook, and finds at the end of the year that he has written a 'textbook' for himself. Such a system, of course, entails more work for the teacher, since the blackboard must often be resorted to; but several years' experience has proven that principles are more easily absorbed by the student when he draws them for himself from practical examples offered, and writes them in his own words in his own 'textbook'. This system of learning composition reminds the student of work in the various laboratories, where he notes in concise form what he has empirically proved.

More closely to identify the English course with other

studies, it is emphasized during the first year, and especially the first part of the first year, that writing clear English is a science in itself. It is pointed out, of course with examples, that one must assemble materials (words) in definite patterns (sentences) so that they act one upon the other to produce the desired result (a complete thought).

Since most writing sins flow from lack of precision in words, much attention is given to them throughout the two years. Here the blackboard gets much use, and student vocabulary is enriched and enlarged by open discussion of words and their various shades of meaning. The early compositions are scrutinized mainly with an eye to precision, and each student receives back his paper for correction with each weak word or phrase indicated.

Once respect for the individual word has been achieved, sentences are considered, and then paragraphs. Not until each unit has been mastered in itself is the larger unit considered. The writing of essays and speeches is not formally talked of till the second semester.

At the beginning of the year each student is given a list of some sixty books, from which he may select a definite number for review. He is expected (and directed) to be particular in his criticism, to be careful that every word and phrase he writes is exactly what he is thinking.

Every student is required to read "Vanity Fair" and toward the end of the year this book is used as illustration material for remarks on the novel in general. At this time also a number of short stories are read in class and the general pattern of them examined. The purpose of this is not to teach the technique of the novel or short story, but to give the students a few fundamental principles of judgment they may apply to all their reading, and to the literature to be read in the second year of the course.

The reading list for freshmen does not vary from year to year, and it does not of necessity include what we can only call the "best sellers" of our day. It is felt that English literature before our own time is rich enough in books undoubtedly worthwhile to make it unnecessary to suggest modern books whose worth only years will determine. Experience has also shown that the student who likes to read will not neglect his contemporaries, though he might neglect more established works.

Though somewhat beside the main purpose of this paper, a few words may here be advanced, in a non-controversial spirit, concerning the use of contemporary literature. In the field of the essay and as models for original work of students, we have no objection to the use of modern material. In fact, we favor it. But for the purely cultural side of the course—and the reading done by students is quite frankly intended to be such—we do not follow what seems to be the common practise of recommending and discussing a large number of books by contemporary authors.

It is mentioned in Mrs. Harris' paper that "the use of the contemporary writing, requiring as it does a minimum of biographical and historical background, makes it possible to concentrate upon the form and content of the work itself, and thus to come closer to some measure of appreciation." We fail to see how the discussion of "old" books demands more time for background. To appreciate "The Pickwick Papers" or "Barchester Towers" or "Pride and Prejudice", must we know anything at all about their authors? Must we know all about the war with Napoleon to enjoy "Vanity Fair", any more than we must know all about our own Civil War to appreciate the current best seller? The old books, in many cases more easily than the new, can be enjoyed without introduction whatsoever—and are so enjoyed, I am sure, by more than half who read them.

It is true, as Mrs. Harris points out, that "the natural appeal of a number of recent books is on our side" when it comes to developing the habit of good reading. Everyone is talking about the latest best seller, and reading it is considered something of a treat. But how many best sellers are worthwhile, and how many can compare, even in the minds of modern book reviewers, with the best works of days gone by? We must be cautious about following the line of least resistance. We are primarily interested, not in what is easiest to teach, but in what is most fit to be taught.

Another point: recommendation of contemporary writings in place of established works often strengthens the student illusion that whatever is old is dead, of no interest to us wide-awake moderns. They see much of the scientific past lying dead around them, and, if given half a chance, will conclude the same thing for the arts.

To sum up our remarks on outside reading, our purpose at Fordham is to put the student in the way of keen intellectual pleasure and to whet his appetite for more. We do not stress contemporary literature because it stresses itself by the mere fact of being contemporary, and because we firmly believe the present can be more sanely judged and honestly appreciated when some knowledge of the past can be used as a criterion.

The freshman year of English at Fordham, then, incorporates these things: (1) an extensive "laboratory drill" in the use of words to express thought clearly and exactly; (2) an examination of the various types of writing and the rules governing them. Under this heading comes a discussion (and actual construction) of the essay, the letter in all its important types, and the speech. (3) A reading and examination of representative novels and short stories, from which are drawn principles calculated to aid the student in everyday discussion.

The second year of English continues the work of the first. By frequent papers the students are again guided in clear personal expression, and are encouraged to develop a certain amount of "style". By the reading of literature and informal discussion of books their imaginations are awakened and their critical faculties sharpened.

Though literature plays an important part in second-year English, the course is not of the "survey" type that Mrs. Harris is so willing to forget. That is to say, the emphasis is put, not upon the history of literature, but upon the literature itself. We aim first at enjoyment, and through enjoyment at appreciation.

Just as freshmen write their own "textbook" of composition from principles brought out in class, so sophomores write their own "history of literature" from not-too-erudite lectures. Instead of using a history of literature as a textbook, we use in class an anthology of English literature and supplement the anthology with a reading list assigned at the beginning of the year. On this list are books not found, because of their size, in the anthology.

All reading from the anthology takes place in class, where each student is called upon to read. This not only insures the selection's being read, but gives the student training in how to deliver intelligently and forcefully the written word.

It really amounts to a subsidiary course in speech delivery, for nowadays most speeches are read. Reading selections in class has this extra advantage, that the selection is fresh in everyone's mind when discussion takes place immediately afterward. There are always conflicting opinions, and their expression gives the student training in extempore utterance.

The reading of literature in class gives rise to many opportunities for debates on the spot and the writing of compositions at home. We may discuss, for instance, the difference between Shakespeare's play, "As You Like It", and Thomas Lodge's "Rosalynde", from which the plot was taken. The discussion naturally and painlessly brings out the essential difference between the tale and the play in general. Or we may discuss (or write papers on) the story of Antony and Cleopatra as treated by Shakespeare in his play of the same name, and by John Dryden in "All for Love". We may read poems by various authors on the same subject, and compare their techniques. We may read parts of "Adonäis", by Shelley, "In Memoriam", by Tennyson, and Milton's "Lycidas"—three poems closely related in subject though far apart in time. Or, in the field of the essay, we may compare Leigh Hunt, Dickens and Chesterton on the subject of Lying in Bed—and try to find out what makes us prefer one over the other, or merely what makes each distinct. These are but a few examples, but they will serve to illustrate the procedure.

There is no doubt that the second year of English is popular with students. And it is popular, not because it is what some would call a "pipe," but because it combines pleasure in the reading of the best literature with an opportunity for airing one's favorite opinions about reading in general and certain authors in particular. It is not uncommon, after class, to come upon a group in the hall or on the paths, every member of which is busy upholding his opinion against the world. There can be, as everyone knows, no greater satisfaction for a teacher than seeing his subject made vital to his students.

The advocates of speech courses for schools of pharmacy will doubtless be disappointed to see a whole year of English "wasted" on literature when it might well be spent in the preparation and delivery of speeches. They perhaps consider it impractical to proceed as we do, and are inclined to ask about the whole second year: *A quoi bon?* We can, of course, point

to the highly practical value of discussion, of reading in public and of writing critical papers. But even if these advantages were not present, we would not hesitate to defend our practise solely on the score that the students are introduced (many, we fear, for the first time) to that fecund source of keen intellectual enjoyment, the literature of the English-speaking world. Let them take with them from Fordham a love for good things to read; let them take the realization that they have only skimmed the surface, and that untold pleasure still waits for their leisure hours—and we honestly care not whether they can sway an audience with their dulcet tones or subdue it by their fulminations.

It may seem an anti-climax to admit that we do pay particular attention to the spoken word. This we do in two ways: by discussions in class already mentioned, and by maintaining a speech forum for those who wish to take advantage of it. This speech forum is not a class, and it has no academic standing so far as credits are concerned; it is an opportunity freely to be grasped by those who wish special training in the art of oral expression.

The speech forum is not included in the curriculum for these reasons: (1) It would, by eliminating other branches of English, assume an importance it does not deserve; (2) it is not sufficiently distinct from other branches of English to warrant exclusive treatment; (3) exclusive treatment often brings about a result opposite to the one desired. Formal treatment encourages a formal attitude, and many students come to regard oral speech as something confined to special occasions instead of being part of their everyday life. Also, when attention to speech is relegated to the one class, results are not so satisfactory as when speech is studied as part of a larger whole. In the old system of education everyone was a teacher of speech. The chemistry teacher was no less alert to errors than the English teacher—which meant there were that many more opportunities for improvement. Now, when educational systems have been departmentalized, a sharp line is often drawn between departments, with the result that the community of Arts and Sciences consists merely in being housed under the same roof. Oral and written expression go hand in hand; to treat them separately is to defeat them both.

The speech forum (details of which it is not necessary to

give, since they are orthodox) is intended mainly for seniors, whose schedule permits them to attend. After three years in college, and with an eye already turned to the world outside of college, they are particularly open to suggestions that may be of help to them.

Such is the course in English we offer students in Fordham University's College of Pharmacy. It is a course calculated to be at once practical and cultural; a course designed to be useful in the narrow world of one's profession and in that broader world of society in which we all move and have our being. It has proved a successful course, so far as results of this sort can be measured. We hope its outline as presented here will be of assistance to those who must now plan for the first time a two-year course in English, and to those who find that their present system is not satisfactory.

Pharmacology for Pharmacists

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The Syllabus states that "the pharmacist should possess an understanding of the chief actions of all important drugs"; also that "it is more important that the pharmacodynamic and therapeutic information of the pharmacist be sound than that it should be either deep or extensive". With this thought in mind the scope of pharmacology courses has been studied.

By agreement between the Boards and the Colleges in District No. 2, a list of 432 products has been proposed, upon which examinations will be conducted. Under districts other than No. 2, where no specific limitations have been imposed, it seems that the list of products on which examinations are conducted, in the schools as well as in state board examinations, is limited only by the United States Pharmacopoeia, the National Formulary, the New and Nonofficial Remedies and the United States Dispensatory. If we assume that 96 didactic hours are actually spent in pharmacology, and that 16 of these are required for review and examination, this leaves 80 hours or 4800 minutes in which to obtain proficiency on eleven features of 432 drugs. This approaches an average of eleven minutes per drug, or 1 minute per feature.

This is really remarkable, when we assume that a student can learn about Opium or Digitalis or Nux Vomica in eleven minutes!!

Since this is obviously impossible, and we are not raising parrots, but pharmacists, it seems that the time is approaching when the relative importance of drugs must be considered in connection with the presentation of their pharmacology. An attempt has been made to determine the relative frequency of prescription occurrence as shown in the various prescription ingredient surveys, particularly the United States Pharmacopoeia and National Formulary survey of 1931-32. This information has been supplemented by data from manufacturing practice, as well as by consideration of theoretical pharmacological significance. Based on the 1933 survey data, recalculated to frequencies per 10,000 prescriptions, Table I was prepared. The frequency per 10,000 prescriptions for Codenia is 850; for Acidum Acetylsalicylicum, Phenobarbitalum, and Sodii Bromidum, was between 400 and 500; etc. The original data of the Survey Report were considered from various angles in the preparation of this table. Those products which appeared to be most important are listed in small capitals; items of less importance are not capitalized.

Contact with physicians revealed the fact that they do not prescribe more than 20 different products, at least in 95 per cent of their prescriptions. Study of Table I led to the selection of 25 important drugs, whose principal actions are given in Table II. For convenience in study the effects have been listed as external, gastro-intestinal tract, nervous system, circulation, respiration, muscles, and endocrine glands. With a fundamental knowledge of the pharmacology of these twenty-five drugs, pharmacists will be in a position to appreciate drug action, to detect pharmacological incompatibilities, to recognize therapeutic indications, and to realize toxicological manifestations.

With this fundamental information, extended to cover constituents, occurrence, dose, etc., we will be presenting useful tangible information. Beyond this pharmacists may be introduced to products of lesser importance, insofar as time will permit—Ulmus, Cantharis, Procaina, and other useful, but less important products.

TABLE I
1933 SURVEY DATA RECALCULATED TO FREQUENCY
PER 10,000 PRESCRIPTIONS

	850 CODEINA 400-500	
ACIDUM ACETYLSALICYLICUM	PHENOBARBITALUM 300-400	SODII BROMIDUM
Acetphenetidinum	Pepsinum 200-300	Sodii Bicarbonas
Acidum Boricum	CASCARA SAGRADA	OPIUM
Ammonium Chloridum	DIGITALIS	PHENOL
Argento-Proteinum	EPHEDRINA	QUININA
BELLADONNA	Glycerinum	SODII SALICYLAS
CAFFEINA	MORPHINA	STRYCHNINA
	NUX VOMICA 100-200	
ACIDUM SALICYLICUM	Gentiana	Potassii Iodidum
Aminopyrina	HYOSCYAMUS	Prunus Virginiana
Bismuthi Subcarbonas	IPECACUANHA	Sodii Benzoas
Bismuthi Subnitras	MAGNESII OXIDUM	Terpeni Hydras
Camphora	Mentha Piperita	THYROIDEUM
COCAINA	Menthol	Tolu
EPINEPHRINA	Phenylis Salicylas	Zinci Oxidum
Ferri Chloridum	Potassii Citras 50-100	Zinci Sulfas
AETHYLMORPHINA	Hydrargyri Chloridum	Petrolatum
ALCOHOL	Mite	Liquefactum
Antipyrina	Hydrargyrum	Phenolphthaleinum
Cinchophenum	Ammoniatum	Potassii Arsenas
ERGOTA	Iodum	Potassii Bromidum
	Methenamina 10-50	Renninum
Acacia	Chloralis Hydras	Oleum Morrhuæ
Acetanilidum	CHLOROFORMUM	OLEUM RICINI
Aconitum	CINCHONA	Oleum Menthae
AETHYLIS NITRIS	GLYCERYLIS NITRAS	Piperitae
Aether	Glycyrrhiza	Potassii Acetas
Aethylis Aminobenzoas	Hydrargyri Chloridum	Rheum
Aloe	Corrosivum	Scopolaminae
Arseni Trioxidum	Homatropinae	Hydrobromidum
BARBITALUM	Hydrobromidum	Sodii Chloridum
Bismuth Subgallas	Liquor Ergosterolis	Sodii Citras
Cannabis	Irradiati	Sodii Iodum
Cinchonidinae Sulphas	MAGNESII SULPHAS	Sodii Phosphas
	Neocinchophenum	Strontii Bromidum
		Theobromina
	1-10	
Arseni Iodidum	Iodoformum	PHYSOSTIGMINA
Bismuthi Subsali-cylas	Magnesi Citras	Procaina
Cantharis	Neoarsphenamina	Santoninum
Hyoscyaminas		Theophyllina
Hydrobromidum	Less Than 1	
Arsphenamina	INSULIN	PITUITARIUM

TABLE II
CHARACTERISTIC ACTIONS OF IMPORTANT DRUGS

Name	External action	Gastro-intestinal tract	Nervous system	Circulation	Respiration	Muscles	Endocrines
Phenol	A	+	—	—	—	—	—
Salicylates	A	+	D	—	—	—	—
Cascara	—	+	—	—	—	—	—
Castor Oil	—	+	—	—	—	—	—
Ipecac	+	+	—	—	—	—	—
Mg Salts	—	+	D	—	—	—	—
Alcohol	+	D	D	D	+	D	+
Barbiturates	+	D	D	—	D	D	—
Belladonna	+	D	D	+	S	—	—
Bromides	+	+	D	—	—	—	—
Caffeine	—	+	S	+	(D)	+	+
Chloroform	A	D	D	(D)	(D)	—	+
Cocaine	+	D	D	—	(D)	?	—
Ephedrine	—	—	S	—	(D)	S	—
Epinephrine	+	—	S	(D)	(D)	—	+
Opium	+	D	D	+	(D)	S	—
Physostigmine	—	S	S	+	(D)	S	—
Strychnine	—	—	S	?	(D)	+	—
Digitalis	—	+	S	D	—	—	+
Nitrites	—	—	+	D	—	—	+
Insulin	—	+	—	—	—	—	—
Pituitary Extract	—	S	—	+	—	S	S
Thyroid	—	S	S	—	—	—	—
Ergot	+	S	D	+	—	S	—
Quinine	—	S	+	—	—	—	—

D — Depress

S — Stimulate

A — Antiseptic

+ — Definite action

— — No significant action

() — Toxic dose

ABSTRACT OF DISCUSSION

Following the reading of his paper, Dr. Munch explained that he had arbitrarily selected the drugs which he thought important, with the thought, that, if properly taught the student would be better prepared than if given a smattering of all those in the Pharmacopoeia and National Formulary. Assuming that the student has a working knowledge of physiology, it is a simple matter to point out principal pharmacological effects. These drugs are classified according to their effects.

Dr. Ziegler commented that after teaching pharmacology for thirty-five years to medical students and to pharmacy students he believes much depends on the approach. If pharmacology is defined as the science of teaching remedial drugs it would include everything; as taught in medical schools physiological action is stressed. The time allowed in pharmacy makes it almost impossible to teach pharmaco-

dynamics. The Pharmaceutical Syllabus specifies more hours, probably, than are required by the Association of American Medical Colleges for medical students. Pharmacy should give more than it does and it should include more pharmacodynamics. An outline along that line would be better than the outline in the Syllabus.

Dr. Christensen, while not agreeing wholly with the outline of pharmacology in the Syllabus, felt that the author of the outline should be commended for his pioneering in the field, with particular reference to its application to pharmacy. It was not the intention of the Syllabus Committee or the people who prepared the outline that everything in it would be taught in every college of pharmacy. Teachers were expected to select the material most applicable to their institution or that could be used in the time allotted to them.

Dr. Dille pointed out that fundamentally pharmacology is unchangeable and too much effort is expended in the approach. The chief criticism of the subject matter in the Syllabus is its poor arrangement.

Professor Bonisteel directed attention to the fact that Dr. Bliss gave an outline of pharmacology in its broadest sense, not necessarily pharmacodynamics. In his own college, the teaching of pharmacodynamics is limited to fifteen drugs but pharmacology includes materia medica, histology, toxicology and some pharmacy. There should not be confusion of pharmacodynamics within pharmacology as a part of the whole.

Dr. Munch concluded the discussion by expressing the hope that the term *materia medica* would cease to be used. It is some of what belongs to pharmacognosy and some of pharmacology. Posology and toxicology are proper functions of pharmacology.

Dr. Youngken pointed out that there has been for some time a difference of opinion in respect to what should be included in a course in pharmacology and that the name *materia medica* is still in use in some colleges.

Reports of Committees at the 1937 Meeting

(Continued from the January, 1938, Number)

REPORT OF THE COMMITTEE ON ACTIVITIES OF STUDENTS AND ALUMNI

Your chairman requested fifty-three member colleges and fourteen non-member institutions to report on certain activities of undergraduates and alumni, and he wishes to express his sincere appreciation for the splendid response. Out of the sixty-seven institutions, fifty-four institutions reported, though in some instances it was necessary to send three letters to get a reply. Seven member colleges did not submit reports. As the reports of this Association are intended to be of mutual benefit to its members, it should be obligatory

that member institutions cooperate by sending accurate information to official committees.

If a percentage value could have been given to each question, it would have been possible to give each college a rating. Naturally, the college with the most activities successfully carried to completion would make the highest average. Whatever the percentage value, a few colleges would have had a low rating because of an apparent lack of interest in extracurricular activities and in contacts with the alumni. When the answer of "No" or no answer is given, for from thirty to fifty percent of the questions asked, one realizes that the institution is not functioning efficiently. This report is intended to encourage institutions to make an analysis of their activities and to establish those that will be of most value to the undergraduates and alumni.

The survey shows that with few exceptions most schools and colleges of pharmacy are stressing extracurricular activities and are making a consistent effort to keep in contact with their alumni. Any type of pharmaceutical activity, whether alumni or undergraduate, should develop loyalty, initiative, leadership, professional morale, sense of responsibility, respect and enthusiasm for pharmacy.

The report I am submitting is a resume of some of the activities as submitted, without any attempt to obtain more detailed information. It was impossible to carry on extensive correspondence because of the lack of funds.

The following are activities that seem to offer particular possibilities according to the reports received:

Continuation Courses. At the request of the officers of the Association, the Committee made a special effort to obtain information on the continuation courses offered to graduates in pharmacy. As this is rather a new type of education, it is not surprising that only six institutions offered such courses during the past year. Several institutions reported that they are perfecting plans for continuation courses and within the next year several of these courses may be established.

Annual Druggists' Conference. Only twelve of the fifty-four institutions held an annual druggists' conference. This is to be regretted because reports indicate that these conferences are highly successful. If a small institution in a thinly populated area can hold successful annual druggists' conferences, there is no reason why the larger schools in the thickly populated areas should not hold similar conferences.

Schools and colleges of pharmacy are established for the druggists of the state. It is therefore incumbent upon the schools to keep in close touch with the druggists. There is no better medium to bring about this contact than an annual druggists' conference.

Pharmacy Exhibits. Sixty per cent of the colleges hold pharmacy exhibits, drug shows, science night, or similar events. For the following reasons these exhibits are indispensable:

1. They disseminate information and create a greater public respect for the services of a pharmacist.
2. They show the importance of pharmacy to public health.
3. In the student body they create a spirit of cooperation, a sense of responsibility, and a greater respect and enthusiasm for pharmacy.

National Pharmacy Week. Seventy-four percent of the colleges reported that they hold some special function to observe National Pharmacy Week. The number should be one hundred percent. In addition to putting on a special program, the colleges should urge all druggists in their respective states to make a special event of this week, as do all other vocations which observe a special week. When the President of the United States, prominent federal and state officials, and others are willing to give special recognition to National Pharmacy Week, certainly all schools and colleges of pharmacy and the drug stores should cooperate.

Pharmacy Exhibits at Meetings of State Medical Societies. The aim of every drug store in the United States and of every school and college of pharmacy should be to bring the professions of pharmacy and medicine closer together. There is no better activity to bring about this contact than to put on a professional pharmacy exhibit at the conventions of state medical societies.

Disseminating Information to the Public. It is incumbent upon the faculties of colleges of pharmacy to use every means to disseminate information concerning professional pharmacy in order to counteract the unfavorable impression gained by the public by inspecting the average retail drug store. This may be done by conducting a column in the newspaper, talks to civic organizations, talks over the radio, and all other means. To be effective, such a campaign must be continuous.

One-half of the colleges reporting gave talks over the radio.

Special Pharmacy Bulletin. Only seventeen of the fifty-four schools publish a special pharmacy bulletin. It is to be regretted that more schools do not stress this important activity, as it is one of the best media of contact with druggists and alumni. A special pharmacy bulletin will be more widely read than a school of pharmacy section in a drug journal. Several schools reported that through advertisements they were able to pay almost all of the cost of publication. The supervision of the bulletin should be under the direction of the faculty, but students should write most of the articles. Even though it would be easier for the faculty itself to write the articles, the students should do most of the work for the experience they will gain.

College of Pharmacy Column in Drug Journal. Without exception, every school and college of pharmacy should publish a news column in the official drug journal of its locality. Not only is this column interesting to the alumni, but it gives the druggists an idea of the progress being made, plans for the future development, and announcements.

Pharmacy Edition of the Alumni Journal. If satisfactory arrangements can be made with the alumni association, a school or college of pharmacy should sponsor a pharmacy edition of the alumni magazine. Because of commencement and alumni functions, the June issue is the most satisfactory. If allowed ample space for advertising, any wholesale or jobbing house should be glad to pay the cost of publication.

Directory of Graduates. One of the most important activities of an educational institution is to publish a directory of its graduates. Regardless of what a graduate is doing when the directory arrives, if at all possible he will immediately make an investigation to determine where his classmates and friends are located. Although it is difficult to publish an absolutely accurate directory, if the alumni notify the school of their change of address, a fairly accurate list is possible. Not only does a directory bind the alumni together, but it serves as an employment list for druggists. As the list includes the patrons of wholesale firms and drug journals, it may be possible to have the directory published free of charge.

Non-Resident Lecturers. The institutions reported an average of 11.5 non-resident lecturers during the past academic year, whereas the number should have been at least

twenty. Except in isolated regions it is possible without cost to the institution to have a non-resident lecture almost every week of the year. It is advisable to outline a program for the lectures, and to cut "trade puffing" to the minimum.

School of Pharmacy Student Loan Fund. Fifty percent of the colleges have a special school of pharmacy student loan fund. Even though pharmacy students may borrow from the general college loan fund, a special pharmacy fund established by druggists and alumni is a highly desirable activity. The best plan of procedure is to ask for subscriptions of \$100.00, more or less, payable in ten installments. As this makes each subscriber an investor in the school of pharmacy, he will, naturally, take more interest in the school's progress and development. The fund should be managed by a group of practical druggists, and it should be identified with the state pharmaceutical association.

College Pharmaceutical Association. Of the fifty-four institutions reporting, nineteen do not have an organization for undergraduates. This is to be regretted because the faculty owes it to the students to establish and support such an organization. Even though there is a Student Branch of the American Pharmaceutical Association in the school, non-members should also have an organization with definite aims and objectives. If the student branch is progressive it will manage the general student association. The programs should be professional and entertaining, and if desired an inexpensive badge or pin could be adopted as the official emblem of the association. Every undergraduate association should make each year at least one trip of inspection to the establishment of a wholesale or manufacturing drug firm.

Dispensing for a Health Service. If a separate health service is maintained on a campus, schools and colleges of pharmacy should dispense prescriptions for the service. This contact gives pharmacy a definite connection with the entire institution. Under the supervision of a registered pharmacist, this service provides a laboratory for the actual compounding of prescriptions for sick persons.

Service Courses. In addition to dispensing for the health service, schools and colleges of pharmacy should give more service courses to the student body. Pharmacy has as much interesting and useful information to offer as any other department. Students enjoy such courses as cosmetics, household preparations, and first aid. There should be more con-

tacts between hospitals and schools of pharmacy. In land-grant institutions members of the pharmacy staff should give lectures to the boys and girls in the 4-H summer session, to granges, and at general farm meetings.

Alumni. The most valuable asset of any institution is a host of loyal alumni. It should be the duty of every member of a pharmacy staff to make as many alumni contacts as possible and to give the requests of the alumni first consideration. All alumni activities should be under the direct supervision of the dean. As it is impossible for many alumni to make trips to the college for alumni functions, it is incumbent upon the faculty to take the college to them by whatever method is most expedient. This may be through monthly news letters or bulletins. The best method of procedure is to make a personal call at the place of business of the alumnus.

Alumni in large cities have organized clubs which have established scholarships, subscribed to loan funds, managed pharmacy functions in honor of a retiring faculty member, presented an oil painting of the dean to the college, established a nucleus of a research fund, published a magazine, put on a drug show, and other activities.

Your committee recommends that the dean of each member college organize at least one new worthy undergraduate and alumni activity during the coming school year.

Respectfully submitted,
A. Ziefle,
Chairman.

REPORT OF THE PROFESSIONAL RELATIONS COMMITTEE

The work of the Professional Relations Committee has progressed during the past year. Questionnaires were sent to 48 state pharmaceutical associations and 70 colleges of pharmacy. Twenty-four colleges and four state associations replied. No doubt many colleges and pharmaceutical associations not returning questionnaires carry on some kind of professional relations work.

The number of replies from the colleges was not disappointing but it would have been pleasing if all colleges had made some reply. The number of colleges engaged in professional relations activities, according to reports received, is 24. This is an increase of one over last year. Four state pharm-

aceutical associations were active during the year. An extensive program has been attempted by Purdue, Minnesota, Buffalo, Howard at Birmingham, and Rutgers. The number of state associations heard from was disappointing. The state associations replying were Oklahoma, Kentucky, Virginia, and Ohio. In Ohio, the Ohio State Association as well as the Ohio Academy of Pharmacy answered.

It has been thought best to develop a long time plan of action for the work of this Committee. We have sufficient data upon which to draw our conclusions. The need for additional professional opportunities is apparent. Without a long time plan, a committee will spend many months out of each year organizing some procedure to follow and before the plan can be put into operation, the term of the committee expires. Therefore, there is much duplication of effort and much valuable time lost. Furthermore, medical groups are annoyed rather than interested in having some plan of cooperation presented to them each year which is just about the same as has been presented on several occasions by previous committees. If a long time plan is put into effect, some of the past criticism can be avoided and much more progress made.

It is hoped that a long time professional relations committee will be appointed to organize a national plan for professional relations work. The American Association of Colleges of Pharmacy and the American Pharmaceutical Association should combine their efforts in this work.

A small amount of money would be necessary to organize and operate this work. A full time man could show results rather quickly but a staff member would need a period of years to satisfactorily carry out the work. The Committee feels that there is a great need for this unified and centralized effort for the pharmacist. If we are going to attract better men and women into pharmacy, we must increase the professional opportunities of the pharmacist.

In order that the convention may have an idea of the contemplated program, we make the following suggestions for a long time plan of operation:

1. Simultaneously with or preceding any campaign to gain additional professional work from the allied medical professions, a campaign to inform the pharmacist of what is being attempted should be carefully worked out. Without the pharmacist's help, the project will be a failure. Instructions to the pharmacist in detail may be necessary.

2. An inventory of material and plans already used in several states should be reviewed. Much of this information is at present available.

3. The work in each state should be carried on through the suggestions of a national committee. There should be two representatives in each state directing this work, one a retail pharmacist, the other, when possible, a college of pharmacy staff member.

4. Time should be set aside at the mid-year and annual meetings of the state pharmaceutical association for the explanation of the working plans for this project. The captain plan or some similar plan is advised for carrying information to all parts of the state.

5. A prescription service to physicians and dentists through their respective state journals, the same to be printed in the state pharmaceutical journal, should be established. The filing card system for prescriptions may be used for a few months and alternated with a series of articles on medication. Filing cards and articles should not appear more often than every other month. This will allow a month of instruction and preliminary work for the pharmacist before new material is presented to medical groups. With this procedure, the service to medicine and dentistry is unlimited in time and material.

6. Plans should be made to detail physicians and dentists by well *qualified* men whose services may be paid for by local or state groups.

7. An inter professional relations committee, composed of physicians, dentists, nurses, and pharmacists, the procedure and plans of which to be supplied by the committee, should be organized.

8. A special committee of pharmacists and physicians, each appointed by their state associations, for the purpose of increasing prescription writing and the knowledge of official drugs and preparations, should be organized. This procedure operates very satisfactorily in several states.

9. A special committee of pharmacists and dentists, each appointed by their state associations for the purpose of increasing prescription writing and the knowledge of official drugs and preparations, should be organized.

10. A committee should be organized to obtain the business of:

- A. Veterinarians
- B. Osteopaths
- C. Chiropodists
- D. Dermatologists

Veterinarians, even in cities where horses have been almost entirely replaced by automobiles, still do a large business treating small animals. Their practice calls for considerable medication but it is usually purchased from some other source than the pharmacist.

11. A committee should be organized to obtain the business of

- A. Beauty salons
- B. Barber shops

Here is a lucrative business for those willing to develop it.

12. A committee should be organized for the purpose of having hospital pharmacists, physicians, or pharmacy teachers instruct internes in prescription writing at hospitals. The possibilities of increased instruction in prescription writing in medical and dental schools should be left to a national committee in cooperation with the national associations they represent.

13. A committee should be organized to study desirability of obtaining review courses or special courses for the pharmacist so that he may better keep abreast of the times and increase his professional services.

14. A committee should be organized to arrange for speakers to appear before:

- A. Medical meetings and conventions
- B. Dental meetings and conventions
- C. Church organizations
- D. Women's clubs
- E. Boy and Girl Scouts and other like organizations
- F. Laymen's organizations of all kinds that could use such a service.

An exchange speaker at each of the medical and dental conventions is desirable.

15. A committee should be organized for scientific displays before medical, dental, and pharmaceutical gatherings and conventions, parent-teachers associations and city libraries. Inexperienced men should never be left in charge of displays but someone who has a broad knowledge of pharm-

acy and its applications so that a great variety of questions asked may be intelligently answered. New thoughts should be suggested to those who have made displays in the past as well as to give plans and information to those making an exhibit for the first time.

There are two colleges of pharmacy that have three-quarters of the outlined program under operation and about fifteen colleges operating half the program. There are no suggestions mentioned that some of the 24 colleges reporting do not have under operation. Many of the 24 colleges have signified their willingness to put all the suggestions into effect.

After listening to the report just presented, I am sure you must realize the tremendous scope of the work of this Committee and therefore, must appreciate that it requires a program which, of necessity, takes several years of continuous effort to put into operation.

Therefore, the Committee recommends that a long time professional relations committee be appointed to organize a national plan for professional relations work. The Committee further recommends that the American Association of Colleges of Pharmacy and the American Pharmaceutical Association combine their efforts in this work.

The Executive Committee of the American Association of Colleges of Pharmacy referred a recommendation made in President Little's address of 1935 to this Committee for consideration. The recommendation was to the effect that a joint meeting be considered with the American Medical Association and the American Dental Association.

This Committee approves that the American Association of Colleges of Pharmacy hold a joint meeting with the American Medical Association and the American Dental Association and that an effort be made to have the American Pharmaceutical Association join us in holding our annual convention at the same time and place as the Medical or Dental Associations so that it can be made possible.

A trustee of one of these associations, when asked his opinion of a joint meeting, was very much in favor of it. The American Dental Association being a smaller convention than the American Medical Association, more opportunities for hotel accommodations to take care of both groups could be found. At the last meeting of the American Medical Association in Atlantic City, all hotels were filled to capacity. The

American Dental Association held their meeting in the same city. At least one good hotel could have been found to meet our requirements.

The committee recommends that we request the American Dental Association to permit a speaker from this Association to present a paper at their convention in St. Louis next year and that plans be made and presented to the American Dental Association for a joint meeting in 1939.

Respectfully submitted,
George C. Schicks, Chairman

REPORT OF COMMITTEE ON RELATION OF BOARDS AND COLLEGES

During 1937, regional meetings of representatives of Boards and Colleges have been held in six of the eight national districts. Two districts in the north and west found it impossible to meet. Dean E. O. Leonard of the University of Idaho, representing one of these districts, states that although four separate meetings were planned for District No. 7, for good reasons none were held. Dean A. O. Michelson of the North Pacific College of Pharmacy, reporting for District No. 8, writes that while District No. 8 held no regional conference, a meeting between the Oregon Board and the two Oregon colleges did take place. He suggests the creation of new and smaller districts in the Pacific northwest. This would probably help his district, but the benefits to District No. 7 would be less clear, since in the latter district there are but four colleges.

Almost all of the districts were fortunate this year in having at their meetings George A. Moulton, President of the National Association of Boards of Pharmacy, and H. C. Christensen, its Secretary. President George D. Beal, of the American Pharmaceutical Association, and President-elect Gathercoal attended at least one of the regional meetings.

The New England district met in Boston in April. It endorsed the work of the American Council on Pharmaceutical Education, considered the problem of admitting candidates from foreign countries to the licensing examinations, and discussed the difficulties of reciprocal relations between certain states. Extension courses for practicing pharmacists, the

influence of state board examinations in pharmaceutical education, and the value of the practical examination were among the other topics discussed.

District No. 2 held its meeting at New York City on March 8 and 9, with about 75 delegates and guests in attendance. All the boards of the district and all the colleges with one exception were represented. One of the most interesting papers of the session was read by Dr. Curt P. Wimmer who had made a study of the activities of District No. 2 as reflected by the resolutions adopted during the past ten years and by the subsequent action that had been taken. This was probably the first attempt of any district actually to evaluate the benefits that come from the annual meetings. District No. 2 made history by approving a plan for a district test examination in the common state board subjects, to be given by a board committee to the senior students in the colleges of pharmacy of the district. Participation by the schools was optional. In a modified form the plan was later carried out with a number of schools participating. At the district meeting, Dean Lemon of the University of Buffalo presented the results of an interesting study of college final examination questions. Among the results he reported were that approximately 90 per cent of the questions studied were found to be tests of memory, and that there is room for considerable improvement in the construction of college examinations. Board members gave a review of pharmaceutical legislation passed and pending in the several states.

The April meeting of District No. 3, held at Charleston, South Carolina, was the first meeting in this district since 1933. All member Boards were represented except Alabama and Porto Rico, and all the colleges except the Universities in Alabama, Mississippi, North Carolina, and Porto Rico. A method of financing future meetings was adopted. Among the topics discussed were state board questions; the practical pharmacy examination; commercial subjects in the college curricula; drug store experience; and recruiting for pharmacy.

District No. 4 of the North Central States, met at Madison, Wisconsin, on March 25 and 26. Progress toward uniformity in educational requirements and in requirements for registration; examinations, and orientation tests were discussed. President George D. Beal addressed the group on "Science in Industry."

The delegates of District No. 5 met in St. Paul, Minnesota, in April. The advisability of having boards accept the results of a comprehensive examination given by the colleges, in lieu of the board examination in theory, proved to be an interesting topic. The desirability of increasing the three-hour practical examination period to one or two days was considered. Commercial subjects in pharmacy curricula, the desirability of an optional five year combined course in business administration and pharmacy, greater selectivity for candidates, and the question of quality versus quantity of graduates were considered.

The southwestern district, No. 6, the last of the districts to meet, convened at Hot Springs, Arkansas, on June 9 and 10. Because of conflicts with commencement dates, the University of Oklahoma was the only college that was represented. The requirement of experience after graduation, placement and aptitude tests for prospective college freshmen, the selecting of board members, commercial subjects, board examinations, and the minimum equipment and the minimum percentage of total sales that should be pharmaceutical before licensing a drug store, were on the program.

It will be noted that certain subjects seemed to be of interest in all sections, coming up for discussion at several of the meetings. It is interesting to learn, too, that most of the regional groups now publish and distribute the minutes of their meetings. That the members desire the preservation of the proceedings of the regional conferences is good evidence of the benefits gained by those who participate in these meetings.

Respectfully submitted,
Hugh C. Muldoon,
Chairman.

REPORT OF JOINT COMMITTEE ON DEGREES IN PHARMACY

At our last annual meeting there was considerable discussion regarding the degrees offered for courses in pharmacy and there seemed to be a feeling that pharmacy should have a specific professional degree. The Committee was appointed for the purpose of studying the question and was asked to report their findings at this joint session. "Shall

pharmacy have a specific professional degree?" is the question that the committee has studied.

During the year there was considerable correspondence between the chairmen and the Committee held a meeting in this hotel last Sunday. Present at the committee meeting were Mr. Mac Childs, Chairman of the Sub-committee for the National Association of Boards of Pharmacy, Professor Ernest Little and Chairman Jordan of the Committee of the American Association of Colleges of Pharmacy. Mr. H. C. Christensen, who happened to be present, was requested to join in the discussion. The Committee has some specific recommendations which will be presented at the close of this report.

You are all familiar with the fact that medicine started with the degree Doctor of Medicine for an abbreviated three-year course or less and that medicine has continued to use this degree throughout the years. The medical course has increased from three to seven years yet the same degree has been granted for the completion of it. With the increased collegiate requirement for this degree it has been placed on a very high plane and is recognized as one of our best professional degrees.

Dentistry did the same. It started with the Doctor of Dental Surgery given for a short course, and the degree has been retained during all the years that dentistry has been advancing its professional standing, and is now given for the completion of the six-year course, placing this degree on a high plane in the minds of professionally educated individuals.

Veterinary Science has done a similar thing, starting with the degree of Doctor of Veterinary Science and retaining the degree as the requirements for it increased.

In the case of pharmacy, the history of the degrees is quite different. Many schools began with a one or two-year course based upon less than high school training and granted the degree of Graduate in Pharmacy for the completion of the course. Other schools have used the degree of Pharmaceutical Chemist for similar courses. The Committee believes that neither of these degrees is suitable as a professional degree for pharmacy and that the use of them should be discontinued. Later the four-year course in pharmacy based on high school training for entrance went into effect and the degree of Bachelor of Science in Pharmacy for the

completion of this course was adopted. It was necessary to use this degree in order to give pharmacy a standing in academic circles and in the minds of educated people.

The Committee believes that this was the right thing to do and that the degree of Bachelor of Science in Pharmacy should be retained for our four-year course. We are happy to say that work in pharmacy has secured standing in academic circles and the degree is now recognized as equivalent to any other bachelor's degree. Your Committee believes that the degrees of Master of Science and Doctor of Philosophy, as now being offered in accordance with the rules and regulations of the American Association of Colleges of Pharmacy, should be retained. In other words, there is no thought in the minds of the Committee that any change should be made in these degrees as specified by the regulations of the American Association of Colleges of Pharmacy.

However, this still leaves us without a specific professional degree for pharmacy. The Committee is convinced that pharmacy will develop more rapidly from the professional standpoint if a specific professional degree is adopted, and further your Committee believes that the degree of Doctor of Pharmacy is the one that should be chosen. You know as well as we do the history of the Doctor of Pharmacy degree. It has been very irregular, having been offered for course work of one or more collegiate years and as an honorary degree. In the minds of some this degree does not have good standing but the Committee believes that it is possible to place this degree on a footing that will make it representative of pharmacy as our professional pharmacy degree, and that in a few years it will secure an enviable standing. We fully realize that it will take time for academic circles and educated individuals to accept it. The Committee feels very keenly the fact that the Bachelor of Science degree has been accepted as the equivalent of any baccalaureate degree. We are proud of this fact and we believe that a similar thing can be done for the Doctor of Pharmacy degree provided we decide to do it. With these thoughts in mind, the Committee offers the following resolutions:

"First: That pharmacy adopt a specific professional degree and that this degree be Doctor of Pharmacy.

"Second: That the degrees and requirements for the

same, as specified in the present By-laws of the American Association of Colleges of Pharmacy, except insofar as reference made to the degree of Doctor of Pharmacy is concerned, be retained."

May I explain that in the By-laws of the American Association of Colleges of Pharmacy, the statement is made that the Doctor of Pharmacy degree cannot be granted for work in courses. We are trying to eliminate that clause in order to make way for a specific degree. Therefore, this last resolution reads this way, if I may read it again, "That the degrees and requirements for the same, as specified in the present By-laws of the American Association of Colleges of Pharmacy, except insofar as reference made to the degree of Doctor of Pharmacy is concerned, be retained."

We are offering the third recommendation for discussion, and this is the recommendation:

"That colleges of pharmacy be permitted and urged to offer a carefully planned curriculum of five or more collegiate years' duration, and that the degree of Doctor of Pharmacy be granted for the successful completion of such a curriculum."

These recommendations are signed by Messrs. Childs, Little and Jordan of the Committee.

Mac Childs
C. B. Jordan
Chairmen.

REPORT OF THE COMMITTEE ON PHARMACOGNOSY OF THE NATIONAL RESEARCH COUNCIL

From the first meeting of this committee which was organized in 1922, and at a time when American pharmacy had no other representation in the affairs of The National Research Council, its members have endeavored to serve pharmacy effectively by stimulating research in pharmacognosy and pharmaceutical botany, and more especially in those problems having a direct bearing upon the health and welfare of the nation in periods of national emergency.

Since its inception it has launched and carried forward work on certain specific projects including researches on methods of quantitative microscopical analysis of drugs,

foods and insecticides, and on South American plants showing promise of yielding useful drugs, etc.

One of the most important of its specific projects which we have been advancing for about ten years has been a survey of the geographical sources of American medicinal plants capable of yielding commercially available amounts of drugs. The chief purposes for the survey are; (1) to take stock of our potential crude drug resources, (2) to ascertain which of our native medicinal plants are being depleted or nearing extinction, and (3) the extent of cultivation of foreign medicinal plants in this country.

When this survey has been completed and its accrued data tabulated and studied we shall be able to make intelligent recommendations to the Council bearing upon the conservation of all medicinal plants grown in this country, experimentation and research on those which have not been cultivated and the cultivation of such as we possess adequate information upon.

The national need for information supplied through such a survey is acute at the present moment.

We have been making use of a large number of foreign drugs of vegetable origin, many of which might possibly be grown here, if steps were taken to determine where they could be grown and what conditions of soil and climate are most conducive to a satisfactory yield of their active principles.

The majority of the countries produce one or more of the seven hundred odd botanical drugs now in use in this country. Any economic or political disturbance in either of these countries affects the supply and the market for these drugs. Much uncertainty exists just now respecting the availability of a large number of important foreign botanical drugs owing to disturbed political conditions and war clouds in Europe and Asia.

The present Sino-Japanese conflict raises the question as to how soon our supplies of ephedra will be cut off. Recently our supplies of ergot, licorice, saffron, olive oil, and a number of volatile oils have been seriously curtailed because of the Spanish conflict.

The ergot situation is so critical that it seems absolutely necessary that we find new sources of supply or provide a substitute.

Many of the botanical drugs now being imported could undoubtedly be produced in our country, but cultural experimentation carried out by competent workers in various sections of the United States is necessary to determine which of these it is possible and commercially feasible to produce.

Our Committee has reported these conditions to the Committee on Federal Relations of the Council and representations have been made to the officials in the Department of Agriculture concerning these matters.

I am pleased to announce that some definite progress has been made on the Medicinal Plant Survey by our Committee, and as evidence thereof I have brought with me a copy of the first publication on the results of this survey. It is entitled "A Survey of Wild Medicinal Plants of the United States. Their Distribution and Abundance."

It contains fifty-two printed pages of survey data and maps. The maps are of the various states in which recent information for the survey has been gathered by our field explorers. The states represented in this issue are Vermont, New Jersey, New York, Pennsylvania, Maryland, West Virginia, Virginia, North Carolina, Tennessee, South Carolina and Florida. The counties of each state are named on the maps. Those from which medicinal plants have been reported are numbered. Beneath each map is a list of counties, numbered in accordance with the number on the map. Following each map are pages of tabulated data. The data is arranged in three columns. In the first column occur the names of the medicinal plants and with them the numbers indicating the counties in which each occurs. In the second column are recorded the region or regions in which each occurs and in the third column is a statement as to how abundant.

The purpose of this and supplementary issues is to provide a reference to the location of sources of botanical drugs in periods of national emergency, to lay a sound foundation for future work in medicinal plant breeding, and to reestablish in this country those useful species which are rapidly disappearing.

This survey is far from complete. From Vermont alone is the data complete. The survey has been retarded owing to lack of funds. In addition to the information published by the

Committee, we have other data gathered through the use of questionnaires from persons who happened to have some data available. Considerable of it represents stations where medicinal plants grow and while useful from the taxonomic standpoint is of little value for the purpose for which this survey is intended. In many instances no statement accompanied the reports of those answering the questionnaires as to even the general extent of availability of the plants.

Readers of this report who are interested in medicinal plants and who are acquainted with those found in their respective districts, or those they may visit, are not only cordially invited to help us on this survey, but urgently requested to do so.

If the survey is to be of value, it should be completed as rapidly as possible. If our federal and state governments would be willing to allocate sufficient funds to selected pharmaceutical institutions or departments of government qualified to participate in this work, a detailed survey of the medicinal plant resources of the remaining states and parts of others which are not covered to date, could be made and suitable maps or bulletins prepared in the course of a few years. In the meantime, the Committee with the limited means at its disposal will continue its efforts to obtain the needed information.

In reporting on the status of medicinal plants in any district to the Committee, correspondents are requested to submit their data as it becomes available even though but one plant can be reported upon at a time. The information desired is (1) the name of the medicinal plant; (2) its location (in dry or wet soil, woods, etc.) including county and state; (3) whether abundant, in moderate numbers, or rare. This information may be forwarded to the Chairman of this Committee, 179 Longwood Avenue, Boston, Massachusetts, or to Dr. A. F. Sievers, Committeeman, Bureau of Plant Industry, Office of Drug Plants, United States Department of Agriculture, Washington, D. C.

Heber W. Younken, Chairman.

REPORT OF SPECIAL COMMITTEE E

Committee on Time When Experience Can Be Secured to the Best Advantage.

The members of this Association will remember that Dean Little in his presidential address in 1935 discussed this subject at length and recommended that the "Executive Committee be requested to give the problem careful consideration and present a definite recommendation to the Association at its 1936 meeting". (Proceedings A. A. C. P., 1935, p. 32.) This recommendation was accepted by the Association and the Executive Committee for 1935-36 studied the questions of the time required for practical experience and the time **when** this practical experience can be secured to the best advantage. In the Executive Committee report for 1936 we find the following: "There is a distinct agreement between the National Association of Boards of Pharmacy and this Association that only one year (of practical experience) should be required but the Executive Committee gave careful study to the question **when** it should be required and now makes this recommendation: "That a committee of three be appointed to confer with the officers of the National Association of Boards of Pharmacy regarding the time **when** the one year of practical experience, now required, can be secured to the best advantage." (Am. J. Pharm. Education, 74).

In accordance with this action the question was discussed with the National Association of Boards of Pharmacy and an agreement reached to the effect that each association appoint three members of a joint committee to consider it and try to reach an agreement. This is a report of the Association's membership of that joint committee.

It seemed wise to us that a report of present practice in the different states be secured as a basis for further consideration of the question. The following questionnaire was therefore sent to the secretaries of all the state boards of pharmacy under date of March 18, 1937.

THE QUESTIONNAIRE

1. Name of State.....
2. Is graduation from college required for registration?....
3. If so, from a 3-yr. or 4-yr. course? 3-yr..... 4-yr.....

4. Amount of practical experience required.....
5. Does your law specify the time when the experience is to be secured?.....
6. If so, when must it be secured?.....
7. Comment on this subject.....

Replies were received from every state except Delaware, Illinois and New Mexico. A tabulation of these replies is here attached.

A study of these replies indicate:

A. That several states have a specific requirement that the practical experience must be secured before registration, and it is assumed that all states have such a requirement.

B. Many states require 4 years of experience but if time spent in college is accepted as experience, such experience cannot run concurrently with college time.

C. Two states require the experience to be after the applicant is 15 years old and one after the applicant is 16 years old.

D. One board (New Hampshire) reports that it favors 2 years of experience, one prior to college and one during or after college.

E. One state (New Jersey) requires 1 year of experience after graduation.

F. One board (New York) believes one year subsequent to graduation is best.

G. One board (Virginia) is in favor of one year of experience before graduation.

H. One state (Indiana) requires that experience follow apprentice registration.

Of the 45 states from which reports were secured, only one requires that the experience follow graduation and only one board expressed itself in favor of such an agreement. In other words, 44 states do not require that the experience follow graduation and one does make such a requirement.

Your Committee recommends to the Joint Committee that:

- A. No experience be accepted prior to age 15.
- B. That experience accepted as fulfilling the requirement and college attendance be not concurrent.
- C. That the examination in practical work be not administered until the applicant has completed the required experience.

A study of these reports show that only four states do not have prerequisite laws in force or on the statute books to become effective within a short time.

C. B. Jordan, Chairman.

REPORT OF THE DELEGATE TO NATIONAL ASSOCIATION OF RETAIL DRUGGISTS CONVENTION

The Thirty-eighth annual meeting of the Association was held in Pittsburgh on September 21-25, 1936. The meeting, one of the most successful in its history, was well attended. Your delegate was present at the opening session and extended greetings and felicitations from our group.

C. Leonard O'Connell, Delegate.

REPORT OF THE FAIRCHILD SCHOLARSHIP COMMITTEE

This year the Committee is composed of George D. Beal, W. G. Crockett, George A. Moulton, and E. G. Eberle, Chairman. Professor B. V. Christensen, of the University of Florida, with the assistance of other members of the faculty, prepared the questions and graded the answers.

Twenty-six candidates representing twenty-one schools participated in the examinations.

The examinations were given under three divisions: pharmacy, chemistry, and materia medica. The highest general average was made in pharmacy, 79.77; next in materia medica, 63.85; lowest in chemistry, 63.32. The general average for the three divisions was 69.98. The highest grade made in pharmacy was 91, in chemistry, 84.5, in materia medica, 89. The lowest grade in pharmacy was 40, in chemistry, 29, in materia medica, 16. The general average in pharmacy was 79.77, fifteen made above that average, nineteen made 70 or over. The general average in materia medica was 68.98, twelve made above that average, twelve made 70 or over. The general average in chemistry was 63.32, fifteen made above that average, ten made 70 or above. The average of the general averages was 74.05. Twelve made above that and twelve made 70 or over.

The report of the twelve highest candidates follows:

Candidate	Pharmacy	Chemistry	Materia Medica	Average
1	91	84.5	89.0	88.16
2	83	81.5	83.5	82.66
3	77	83.5	79.0	79.83
4	85	75.5	72.5	77.66
5	89	66.5	75.0	76.83
6	76	76.0	77.0	76.33
7	85	69.5	72.5	75.66
8	71	76.0	75.5	74.16
9	73	72.5	73.0	72.83
10	76	72.0	65.0	71.00
11	72	66.0	73.5	70.50
12	61	69.0	81.0	70.33

The candidate making the highest average, 88.16, made the highest record in all branches; the next in line made 82.56.

The winning candidate is Frank Thomas Maher, of the Illinois College of Pharmacy.

E. G. Eberle,
Chairman.

Report of the Committee on Pharmacy Predictive and Achievement Tests

The Committee on the Study of Pharmacy Aptitude Tests convened at Purdue University, Lafayette, Indiana, on November 27-28, 1936. This meeting was made possible by a grant from the American Council of Education. The members of the Committee present were:

B. V. Christensen, University of Florida
R. L. McMurray, representing Ernest Little
H. H. Remmers, Division of Educational Reference,
Purdue University, as Technical Advisor
C. J. Klemme, Purdue University, Chairman

Others present who acted in an advisory capacity were: C. B. Jordan, C. O. Lee, C. J. Zufall, H. G. DeKay of Purdue University; F. J. LeBlanc, South Dakota State College; F. S. Bukey, University of Nebraska.

At this meeting a detailed plan on the study of pharmacy aptitude tests was drawn. Since the Executive Committee had, at the 1936 meeting, referred the study of objectives and objective tests to this Committee, this study was also included

in the plan. The Committee requested the Chairman of the Executive Committee to change the name of the Committee to "Committee on Pharmacy Predictive and Achievement Tests" as being more inclusive and definite. The chairman also requested power to enlarge the Committee. The requests were granted and the following were added to the Committee:

Ralph Bienfang, University of Oklahoma
F. S. Bukey, University of Nebraska
H. M. Burlage, University of North Carolina
F. J. LeBlanc, South Dakota State College
A. B. Lemon, University of Buffalo
R. L. McMurray, Ohio State University
D. W. O'Day, University of Colorado
L. W. Rising, University of Washington

The detailed plan which was drawn was submitted to the Committee on Measurement and Guidance of the American Council on Education for advice, criticism and with a request for the approval of the Council. If this approval were secured, the plan would be laid before a foundation with a request for a grant to carry out the project.

The Committee on Measurement and Guidance referred the plan back to this Committee and appointed W. W. Charters to act as an advisor to aid in revising the plan. Certain suggestions were made for the revision, chief of which was that the Committee first concentrate on the study of measures of achievement. When this has been accomplished the Committee should then study predictive measures using the achievement criteria as means of correlation. By doing this, the Committee would avoid the pitfalls whereby the professions of law, medicine and engineering have failed to obtain a correlation between prediction and achievement.

The plan was revised by the technical advisor and the chairman after a conference with Dr. Charters at Columbus, Ohio. This revision has been sent to all members of the Committee. It has also been placed with Dr. George F. Zook, President of the American Council on Education.

In brief, the revised plan calls for an exhaustive study of measurements of achievement in pharmaceutical education. First, objectives must be set up in the four major fields of pharmaceutical education; namely, pharmacy, chemistry, pharmacognosy, and pharmacology; second, measurements of achievement based on these objectives are to be set up; third, these measures of achievement are to be administered to

graduating students in perhaps ten or twelve member-colleges; and fourth, by a statistical analysis the validity and reliability of these criteria are to be determined. This study is designed to continue for a period of four years. Once the criteria of achievement have been determined, the Committee will then proceed with a later study on predictive measures, and it is vitally necessary that our criteria of achievement possess validity and reliability before we can proceed with the study of predictive measures.

Expenses:

Postage and express.....	\$11.82
Traveling expense:	
H. H. Remmers and C. J. Klemme, Lafayette, Indiana	
to Columbus, Ohio, and return.....	24.00
	<hr/>
	\$35.82
Received from Miss Cooper.....	10.00
	<hr/>
	\$25.82

The Committee recommends:

1. That, subject to the approval of the American Council on Education and the securing of a grant to finance the project, the study on measurements of achievement be carried out as outlined in the revised plan.
2. That the Association contribute to the support of the study by applying a fund equal in amount to that voted for the support of a study on pharmaceutical education in 1929. This support would be used only to augment the grant from a foundation.
3. That this Committee co-operate with the Syllabus Committee in setting up a basic curriculum for the professional subjects.

C. J. KLEMME, *Chairman.*

A Proposed Study on the Measurement of Achievement in Pharmaceutical Education

I. Organization for the Study.

This study is being undertaken by the Committee on Pharmacy Predictive and Achievement Tests under mandate of the American Association of Colleges of Pharmacy.

In accordance with this idea, Robert C. Wilson, University

of Georgia, succeeding president of the Association, appointed the Committee on the Study of Pharmacy Aptitude Tests, the committee consisting of Ernest Little, Rutgers University; B. V. Christensen, University of Florida; and Carl J. Klemme, Purdue University, Chairman. He also requested A. B. Lemon, University of Buffalo, to act in an advisory capacity. At the request of the chairman, Dean Wilson appointed H. H. Remmers, Division of Educational Reference and Department of Education, Purdue University, as Technical Advisor. At his suggestion the official name of the Committee was changed to Committee on Pharmacy Predictive and Achievement Tests in recognition of the necessary scope of the study. Until a more adequate criterion of achievement was established, results from predictive tests would necessarily be disappointing.

In view of the work to be done and the importance of proper administration in the trial tests, it has been deemed advisable to increase the size of the committee. Accordingly, the following men in the fields of pharmacy, pharmaceutical chemistry and materia medica have been added to the committee:

H. M. Burlage, School of Pharmacy, University of North Carolina
Ralph Bienfang, School of Pharmacy, University of Oklahoma
F. S. Bukey, College of Pharmacy, University of Nebraska
F. J. LeBlanc, Division of Pharmacy, South Dakota State College
Robert L. McMurray, School of Pharmacy, Ohio State University
David W. O'Day, College of Pharmacy, University of Colorado
L. Wait Rising, College of Pharmacy, University of Washington

The Committee feels the necessity of a consulting committee composed of experts in the educational field and has therefore requested the following to act in an advisory capacity:

W. W. Charters, Ohio State University
K. J. Holzinger, University of Chicago
D. A. Robertson, Goucher College
L. L. Thurstone, University of Chicago
Ben Wood, Columbia University

These have indicated their willingness to serve on the consulting committee without remuneration other than actual expenses.

II. *Original Plan of the Study.**

The committee was formed, as indicated, for the purpose

*This plan is outlined in a report of the committee under date of November 27-28, 1936.

of setting up and subjecting the trial aptitude or predictive tests which could be applied to students entering colleges of pharmacy. It was early recognized, however, that such a study would be of little or no value unless criteria on the measurement of achievement were first developed. Accordingly, the committee outlined a program of study which included work on predictive and achievement tests. This plan was open to criticism on two counts. First, it would probably be uneconomical to attempt the study of predictive tests until the methods of measuring achievement have been developed and their reliability determined. Second, the number of institutions to be studied was probably too large.

Therefore, as the committee has proceeded with its work, it has recognized the fact that the development of achievement criteria and of instruments to measure achievement must precede the study of predictive tests. The experiences in other fields of professional education, such as medicine and law, where there have been disappointingly low correlations between prediction and achievement, undoubtedly because of the inadequacy of conventional semester marks as measures of achievements, make clear the necessity of such a program.

When valid methods of measuring achievement have been established in pharmacy, the committee will turn its attention and endeavors to a study of predictive tests.

III. *The Need for Such Study.*

A. Educational guidance and placement has for some time been under heavy attack because of its shortcomings. Now in addition to this, and due to ever-increasing numbers of students entering the profession of pharmacy, it has become apparent that sound, selective measures will soon be necessary, measures by which the colleges of pharmacy will be able to select students on the basis of character, ability, and general aptitude for pharmacy. These selective measures may well be in the form of aptitude or predictive tests which would serve as a sound basis of educational guidance.

B. There is an ever-increasing need for educational vocational guidance among American youth of today. This, of course, is an obvious and well recognized fact. The use of predictive tests will, it is believed, serve as a means of judging whether or not an entering student should be encouraged in or deterred from pursuing the profession of pharmacy. Of even greater importance, as far as pharmacy is concerned, is the

guidance of students during their college careers, since pharmaceutical education has the function of producing individuals qualified not only for retail pharmacy but specialized fields such as research, manufacturing, clinical laboratory work, teaching, and general training for all in public health.

C. There are aptitude or predictive tests of proven worth in some fields, such as the tests in English and the psychological examinations. These have universal application, but we must set up our own tests in the sciences and possibly in mathematics. But we will have no sure means of knowing the validity of such tests unless we first set up a means of measuring student achievement to get a correlation between prediction and achievement. This correlation may be obtained to some extent by following the progress of each student according to his or her scholastic marks, but college marks are notoriously lacking in validity and reliability. *Experimentation with improved criteria of achievement is therefore of great importance.* In the first place, college marks as now given are much too dependent upon individualism, both on the part of student and instructor where personalities, personal likes and dislikes, etc., are all too often influencing factors. In the second place, various colleges have vastly different methods of examining and grading and such variation exists to the extent that it makes prediction impossible. It is common professional knowledge that semester marks contain large constant as well as variable errors of measurement. The most logical method for the measurement of validity in our predictive tests seems to be the use of comprehensive tests at or near the close of the student's college career. Above all things we must not err in considering our predictive tests as valid until they have been so proven, for an attempt at guidance in the face of such error would be fatal to the accomplishment of the aim. *Therefore, the committee feels that in its duty to set up pharmacy aptitude tests it must first provide the means of validating these tests by setting up comprehensive examinations.*

Among the more important sources of material for such examinations are:

1. Charters' "Basic Material for a Pharmaceutical Curriculum."
2. Pharmacy schools.
3. State boards of pharmacy.

4. Practicing pharmacists.
5. Representative members of the American Pharmaceutical Association.

D. In order to set up such comprehensive examinations, we must have a basis on which to work. A basic and representative pharmaceutical curriculum may be set up by a study of the Charters' Report and the Pharmaceutical Syllabus. Such a curriculum, covering the four fundamental fields in pharmaceutical education, should then be submitted to the members of the American Association of Colleges of Pharmacy for criticism, comments, and finally for approval. Definite statements on the requirements of various state examining boards must be obtained in order to outline clearly the needs of the student to meet the legal requirements of the profession. Statements from a representative cross-section of practicing pharmacists must be obtained in order to outline the professional, commercial, ethical, and civic requirements of the student. These statements may be augmented by information obtained from representative members of the American Pharmaceutical Association. Following this it is essential for the objectives of each course in the curriculum and each phase of the profession to be set up, and on the basis of these definite objectives, a battery of comprehensive measuring instruments for achievement of the defined objectives will be furnished.

E. To cover the desired work in any course adequately and to examine students in the covered work intelligently it is absolutely essential that the instructional staff be thoroughly conscious of the objectives which they wish the student to attain. While this fact is recognized by some, a vast majority of teachers are not conscious, or at least not more than hazily conscious, of the actual objectives in the courses they teach. The construction of objectives must necessarily draw closer attention of instructors to the material and ground to be covered in each course which would inevitably result in considerably better instruction. Such instructional improvement can obtain in any field, because any teacher, worthy of the name of teacher, will welcome a means of improving his work to the end that he will improve his products. It is not the immediate aim of the committee to bring about such a transition in teaching methods, but it will probably be one of the several ultimate effects of the committee work.

F. According to the best information obtainable by the committee no such study as the one proposed has ever been carried out by a large group of the educators in any profession. The criterion here proposed is similar to that used by the North Central Association in the study under the general direction of Dean M. E. Haggerty, i. e., not educational facilities and processes, but the quality of the end-product. There can be no doubt that many defects exist in pharmaceutical education, but to lay a finger on each of these defects and to cure them requires exceptionally careful study of the entire system. Such a far-reaching program as the one outlined may well bring to light many of the defects of which we are not conscious and at the same time point to remedial measures of both known and unknown defects.

IV. Basic Material for Objectives.

While it will be necessary in the study to secure basic material for objectives, the committee can at the present time lay down a tentative basic pharmaceutical curriculum. This curriculum represents the efforts of the committee to define the four general fields of subject matter to be studied with reference to objectives and achievement tests. It should be pointed out immediately that this tentative curriculum is to be submitted to the member-colleges of the Association for comments, criticisms, etc., after which a revised curriculum, changed insofar as is possible on the basis of these criticisms, will be set up and submitted to the member-colleges for their approval.

The tentative outline is based very largely on contents of the Charters' "Basic Material for a Pharmaceutical Curriculum" and the "National Pharmaceutical Syllabus" and therefore, in defining certain courses, frequent reference will be made to these two important works. The outline at present is:

I. Pharmacy

A. Beginning (General)

1. Elementary Pharmaceutical Principles and Processes
2. Elementary Pharmaceutical Technique (Operative Pharmacy)
3. Pharmaceutical Arithmetic
4. Pharmaceutical Nomenclature

B. Advanced

1. Manufacturing Pharmacy (Small Scale Production)
2. Pharmaceutical History

- 3. Pharmaceutical Literature
- 4. Commercial Pharmacy
- C. Dispensing
 - 1. Prescription Practice
 - 2. Incompatibilities
 - 3. Jurisprudence
- II. Chemistry
 - A. Beginning (General) Chemistry
 - B. Inorganic Qualitative Analysis
 - C. Inorganic Quantitative Analysis
 - D. Organic Chemistry
 - E. Biochemistry
 - F. Drug Assay
- III. Pharmacognosy
 - A. Beginning (General) Botany
 - B. General and Macroscopic Pharmacognosy
 - C. Microscopic Pharmacognosy
- IV. Pharmacology
 - A. Biology and Physiology
 - B. Bacteriology
 - C. General Pharmacology
 - 1. Pharmacodynamics
 - 2. Therapeutics
 - 3. Toxicology
 - 4. Posology
 - 5. Biologic Standardization
 - D. Principles of Biologicals
- V. *The Proposed Program of Study.*

A. Information upon which to base objectives in pharmaceutical education must necessarily come from sources wherein such education is administered and practiced, viz., the schools of pharmacy and the operating pharmacies. The intermediate agencies between the schools and the drug stores, that is, the state examining boards, are a third important source of facts pertaining to the requirements of the pharmacist. Two other sources of information are already at hand. These are a basic pharmaceutical curriculum and the Charters' Report. In all probability it may be necessary to revise, according to information received from other sources, the basic curriculum.

It is planned to obtain the necessary data by the use of questionnaires and wherever possible personal contacts. This work can probably be done under the supervision of the Chairman and the Technical Advisor by one man and an assistant in a period of about three to four months. Considerable data have already been collected.

In this, as in other phases of the study, the committee will necessarily call upon the Consulting Committee for advice and guidance.

B. The task of setting up the objectives in pharmaceutical education must fall to the committee as a whole. All data, as soon as obtained, shall be made available to the members of the committee in order that they may study it at length and be prepared to take part in this phase of the work. It will be necessary, likewise, for the committee to obtain the advice of several who are experts in the field of setting up and measuring objectives. For this, the committee will turn to members of the Consulting Committee.

C. The construction of a battery of devices to measure relative attainment of the defined objectives will be carried out by one or more test experts in conjunction with four or five individuals each of whom is a specialist in one of the fields to be covered by tests, viz., pharmacy, pharmaceutical chemistry, and materia medica.

The construction of test batteries should be an annual process in order that there be no duplication of tests. After a period of ten to twelve years, it would be possible to select test items for a comprehensive examination from those accumulated without detriment to the project. Yet the formation of test batteries must be a continuous function of the committee, not only in forming test batteries from selected test items, but in introducing new test items that must necessarily arise with the progress of the sciences related to pharmacy.

The batteries of testing devices must be adequate to measure the relative attainment in the appropriate number of objectives.

D. The testing devices will be administered to seniors in certain selected schools of pharmacy at some time during the month of May each year. Of the 56 member-colleges in the Association, 10 or 12 will be chosen for the experiment, since it would be financially and experimentally impractical to include all schools. Twelve schools have thus far been chosen and this number will give a sampling of about 450 to 500 students each year. The schools have been chosen considering their geographical locations, local surroundings, and economic conditions. These schools have indicated their willingness to

participate in the proposed study. The list of schools chosen for the experimental work is given in the Appendix.

E. The technical work of statistical analysis and evaluation of the measured results will be carried out in the Division of Educational Reference at Purdue University, under the general supervision of Professor Remmers, Technical Advisor to the Committee. The new scoring machine made available by the International Business Machines Corporation is a part of the equipment available, as well as sorting and tabulating machinery.

In addition to determining the adequacy of the measuring devices with respect to reliability, and improvement of this where necessary, it is expected as far as may be possible to evaluate the individual test items with total scores as criteria. In time this will yield measuring devices of maximum validity and reliability. Against such criterion measures it will then be possible in the second major phase of the study to select, construct and evaluate prognostic measuring instruments. The services of the Advisory Committee will again be obtained in the evaluation of the detailed plans for analysis to be set up when the achievement battery has been assembled.

Results will be analyzed in terms of participating institutions and totals. The preparation of written reports to the institutions and organizations concerned will be the joint task in the first instance of the Chairman and the Technical Advisor of the Committee.

VI. Types of Objectives to be Measured.

The following outline of types of objectives to be measured is the result of the work of the Committee on Standards of Instruction at Purdue University for which Professor Remmers acted as consultant. It is given here to indicate the general outline according to which its objectives will be defined preliminary to setting up the specific situations in which students in pharmacy will show the presence or absence of characteristics defined as objectives.

The original outline as set up by the Committee on Standards of Instruction has been modified to conform more nearly with the requirements of pharmaceutical education. This modification was made by the Technical Advisor and the Chairman of the Committee of Pharmacy Predictive and Achievement Tests.

A. Information

1. Vocabulary (terminology in the special field)
2. Specific facts
3. Definitions
4. General laws and principles
5. Technological processes
6. Historical background

B. Reasoning or Scientific Method—Ability to gather, classify, organize and interpret data

1. Accuracy of observation
2. Induction
3. Deduction
4. Analogy
5. Ability to propose and test hypotheses
6. Ability to distinguish between fact and theory (phenomena vs. concepts)
7. Willingness to suspend judgment in the absence of pertinent data
8. Critical evaluation of:
 - a. Traditions
 - b. Precedents
 - c. Opinions
 - d. Prejudices

C. Location of Relevant Data

1. How to find, abstract, file, use and interpret literature, including:
 - a. Textbooks
 - b. General reference books
 - c. Encyclopedias
 - d. Newspapers
 - e. Periodicals
 - f. Abstract journals
 - g. Radio discussions
 - h. Special research literature
 - i. Transactions of scientific and technological groups
2. Use of governmental and industrial sources of information in various technical fields
 - a. Governmental statistics
 - b. Governmental reports
 - c. Patents
 - d. Industrial catalogs and advertisements

D. Skills Characteristic of Particular Subjects

1. Manipulation of materials and equipment in laboratory:
Weighing, measuring, filling capsules, dividing powders, avoiding incompatibilities, etc.
2. Skills in:
 - a. English (oral and written)
 - b. Mathematics
 - c. Physical sciences

- d. Biological sciences
- e. Social sciences
- f. First-aid treatment
- 3. Skills in creative art (window dressing, advertising, displays)
- E. Standards of technical performance as set up or accepted by competent authorities. (This will include knowledge of appropriate standards, ability to evaluate the relative importance of several standards which apply and skills in habits in applying these standards.) (Analytical processes, Qualitative and Quantitative)
 - 1. Standards defined by authorized committees of technical, scientific, and other similar organizations (U.S.P. and N.F.)
 - 2. Methods and practices accepted by workers in special fields
 - 3. Standards set up by departments and instructors
- F. Reports:
 - 1. Kinds
 - a. Records of original observations and experiments
 - b. Abstracts and library reports
 - c. Lecture reports
 - 2. Characteristics:
 - a. Thoroughness
 - b. Organization
 - c. Conciseness
 - d. Accuracy
 - e. Neatness
 - f. Proper documentation
 - g. Adequacy of interpretation and conclusions
- G. Social mindedness and personal characteristics:
 - 1. Social adjustment
 - a. An ability to adjust oneself easily in business and social contacts
 - b. An understanding of one's relation to society as a whole
 - c. An appreciation of social attitudes in other classes and cultures
 - d. A knowledge of the fundamental motives underlying social behavior
 - e. An interest in social problems
 - 2. Character Development and Personal Characteristics Amenable to Training:

From the educational and psychological literature literally hundreds of "traits" can be listed. (Psychological Monograph 211, "Trait Names", by Allport.) Therefore, individual instructors, departments, schools and institutions will have to agree upon such desirable traits as are to become important objectives of education. Character and personality are to a very large degree amenable to training and experience in the social culture pattern. They are not closely related to intellectual capacity as this is conventionally measured and can therefore not be assumed to result automatically from intellectual training. (Detailed

outline of objectives for a general course in Organic Chemistry may be found in the Proceedings of the American Association of Colleges of Pharmacy—1935.)

VII. *Continuance of the Plan.*

In order for lasting benefit to come from the study, the committee must become one of the permanent units in the organization of the American Association of Colleges of Pharmacy and receive the co-operation and support of not only the member-colleges of the Association but also all national pharmaceutical organizations which are concerned with the educational phases of the profession. Moreover, the work must be continued in connection with the proposed study on predictive measures which is the original purpose of the committee work and which will be carried out upon the completion of this study on measurement of achievement.

Support for continuation of the work will be derived in part from the sale of examinations, but since such revenue would be small due to the limitations of the field, it will be necessary to obtain contributions from the pharmaceutical organizations interested. This we believe can be done.

VIII. *Estimate of Cost.**

This estimate is based on the facts as nearly as the committee can determine them at the present time. It is, of course, difficult to predict enrollments and percentage of failures, especially in view of the rapidly changing conditions of the times. These figures are based on an estimate of an average of 40 graduates per year from each of the twelve test schools.

1. Managing Director	\$12,000.00
2. Technical Advisor	14,400.00
3. Educational Expert (Test Specialist)	12,000.00
4. Pharmacy Specialist	10,000.00
5. Pharmaceutical Chemistry Specialist	10,000.00
6. Materia Medica Specialist	10,000.00
7. Clerical staff	10,000.00
8. Supplies, stationery, and postage	1,500.00
9. Scoring, Analysis and Statistical Service	3,500.00
10. Printing	5,000.00
11. Travel Expense	5,000.00
TOTAL	\$93,400.00

*On December 16, 1937, the chairman and technical advisor met with Messrs. W. W. Charters, Ben Wood and Ralph W. Tyler who suggested changes in the budget which brought the total to \$155,000.00. A full report will be made on this at the 1938 meeting.

*IX. Proposal to Raise Funds for the Study.**

At the present time there is in the treasury of the American Association of Colleges of Pharmacy, a sum amounting to \$7,265.97 which was obtained by assessing the member-colleges for the Study of Pharmacy and Pharmaceutical Education, as proposed in 1929. The quota was \$15,000, but when it was obvious that the plan would not materialize, some of the colleges did not contribute. If other funds were made available, it is possible that the colleges which have not contributed would do so, and thus a fund amounting to about \$15,000 might be raised by the American Association of Colleges of Pharmacy. If the American Council on Education will support an application for funds to a foundation, we shall with this assurance complete our American Association of Colleges of Pharmacy quota which we hope will be \$15,000.

The Committee will endeavor to secure the financial support of the American Pharmaceutical Association and the National Association of Boards of Pharmacy, but the extent of this support is at present unknown. To the extent that such support from the professional organizations is obtained the amount to be requested from a foundation will be reduced. More definite information on this point will result from the meetings of these bodies in August, 1938.

In order to make this proposed study possible, the committee must approach a foundation with a request for an amount necessary to complete the budget.

Before taking such action, however, the committee wishes to submit the plan to the American Council on Education, requesting criticism, suggestions, or approval of the project.

Respectfully submitted,

Committee on the Study of
Pharmacy Predictive and Achievement
Tests, American Association of Colleges
of Pharmacy,

H. H. REMMERS, *Technical Advisor.*

C. J. KLEMME, *Chairman.*

June 14, 1937.

*It is now known that this plan is not feasible and a new plan has been suggested. This will be reported at the 1938 meeting.

APPENDIX

School of Pharmacy, University of Buffalo.
College of Pharmacy, University of Colorado.
School of Pharmacy, University of Florida.
College of Pharmacy, University of Nebraska.
School of Pharmacy, University of North Carolina.
College of Pharmacy, Ohio State University.
School of Pharmacy, University of Oklahoma.
School of Pharmacy, Purdue University
New Jersey College of Pharmacy, Rutgers University.
Division of Pharmacy, South Dakota Agricultural College.
College of Pharmacy, University of Washington.

Medical Tragedies

Experiments conducted since the death of 11 persons, who had been treated with cancer serum, have shown that mice treated with this serum have reacted much as the human patients did. They developed symptoms of tetanus and died within 24 hours. The experiments have been conducted by the federal food and drug administration. Officials of that administration have expressed the belief that the serum was contaminated.

This medical tragedy, following so quickly a similar one in which use of a new remedy was the cause of a large number of deaths and which was designated by high authority as a medical blunder, has caused laymen at least to question the thoroughness of experimentation before risks are taken. Experiments just conducted by the drug administration might well have been conducted in advance of the use of the serum on human bodies. Human lives would have been saved if that had been done.

The public is assured that all shipments of the particular quantity of serum believed to have been contaminated have been recovered and that danger of further deaths has been eliminated. The inference is however, that other quantities of this drug were distributed, and while they may be free of the contamination shown to exist in at least one, an uneasy feeling is produced.

This case recalls the sulfanilamide tragedy of a few months ago in which the loss of life was much greater. It is a second and quickly following indictment of our methods of drug preparation and distribution. The situation does not guarantee a thoroughness and care in proving drug effects that the general public has a right to expect. The two incidents expose a situation in preparation and distribution of newly discovered remedies that the public should demand shall be changed for the better.—Editorial, Nebraska State Journal, April 1938.

(Such Editorials should help the cause of better food and drug legislation.—Editor.)

EDITORIALS

Who Speaks for American Pharmacy?

From time to time our attention is called to articles appearing in the pharmaceutical trade journals with the implication that the policies discussed in them are accepted in many quarters as what American pharmacy stands for, and therefore what it is judged by. Among the better informed such incidents arouse some resentment, although the trade journals themselves must not always be held responsible for inducing these conclusions. The fact is that some of these journals have made such a place for themselves that their readers fail to recognize their true status in this connection.

What journals, then, are the official mouthpieces for organized groups in this country? There can be no question that the *Journal of the National Association of Retail Druggists* speaks with authority for organized retail pharmacy in America. We are never in doubt about what this organization stands for and how those in control propose to realize their objectives. The *Journal of the American Pharmaceutical Association* is the mouthpiece of the oldest and altogether the most widely representative organized group of pharmaceutically minded people in America. Usually rather conservative it nevertheless represents faithfully, we believe, the point of view of the majority of the membership. What it says, it says with authority.

The *American Journal of Pharmaceutical Education* represents the most highly specialized, and in many respects the most idealistic if not the most practical group in American pharmacy. Removed from the hurly burly of the commercial world, educators are in position to see, or at least think they do, how things ought to be. Further, they have the time, and sometimes the urge to formulate plans for bringing about needed changes. They have set for their part in pharmacy certain very definite objectives: graduation from high school, and successful completion of a standard four year course in pharmacy for all who go into the work has now been prac-

tically realized. The educators themselves did this job, aided and abetted, of course, by other organized groups. The standard was not superimposed upon them. Its accomplishment has marked the most definite item of progress in pharmacy in the past century.

The stand of the American Association of Colleges of Pharmacy on proposed changes in federal food and drug legislation was known throughout the drug field early in the agitation for these reforms. There was no hesitancy or sidestepping the issue. As an organization, and in individual capacities, the fight has been waged now for almost five years, and these aggressive policies will be continued until the American public has better protection against fraud and misrepresentations in the advertising and sale of foods, drugs, and cosmetics. If we had not made such a fight we would have proven ourselves both cowardly and unworthy.

Another problem pharmacy has had to contend with from the beginning, and must have on its hands as long as human nature remains what it is, is that of illegal counter prescribing. That there is too much of it is fully realized by those familiar with retail pharmacy. That there will always be some of it is regretfully conceded. With the educational requirements now prevailing for entering the practice of pharmacy, the colleges for the first time have a nation-wide opportunity and responsibility for developing in their graduates ethical conceptions of this problem which was impossible under the old preceptorial system, and we may say confidently that this objective will continue to be one of the most important items in our agenda for the next generation.

Ignorance and cupidity have been responsible for most of the illegal counter prescribing. A smattering knowledge about drugs has led pharmacists into practices fraught with grave danger to the consuming public. Pharmaceutical educators know this better, perhaps, than does any other group in the whole health service field, and we are dedicated wholeheartedly to its gradual elimination.

There are other objectives to which the schools of pharmacy of the country must commit themselves enthusiastically. The American Journal of Pharmaceutical Education, as the first mouthpiece that organized education in pharmacy has had in its history, gives us opportunity to identify ourselves

publicly with many issues that we are in best position to both initiate and prosecute to successful ends.

Wortley F. Rudd.

The Minneapolis Meeting

One of the unanticipated benefits that has come from the establishing of the American Journal of Pharmaceutical Education is the opportunity it affords our Association to modify and improve its procedures at the annual meeting. At the close of the 1937 convention, the opinion seemed to be general that our meetings can and should be made more helpful to those who attend them. The Executive Committee has given much thought to the problem with the result that at Minneapolis certain experimental changes will be made.

Most of the work of the American Association of Colleges of Pharmacy, like that of similar associations, is done by committees. The appointment of a committee presupposes that the work it is to do is important to the Association. The members of the committee work long and zealously, often at considerable personal sacrifice, and eventually arrive at conclusions that should be reported to the Association at the annual meeting. These committee reports are highly important. Their value must not in any way be minimized. But with the establishing of the Journal, the situation has changed to the extent that the chairmen of some committees may now be permitted to report to the convention an abstract of their findings, sufficiently complete for full understanding, but abridged by the omission of statistical details and similar matters that will later appear in the published report. Considerable time will be saved by this procedure whenever the nature of the report will permit such abbreviation. It is possible that most of the reports this year can be received at the first session of the convention since the Executive Committee is contemplating other changes that will expedite the handling of routine matters.

An entirely new feature is planned for the Monday evening session. Following the usual dinner a panel discussion on Socialized Pharmacy will be held with Dr. Earl R. Serles, of the Division of Pharmacy of South Dakota State College

presiding. Panel members will be chosen from a half dozen colleges. General discussion from the floor will follow the formal presentation. This innovation should prove to be both interesting and beneficial. Thoughtful consideration of this timely topic will enable members to clarify their thoughts concerning this increasingly serious matter.

Chairmen and secretaries are making a determined effort this year to interest more teachers in the work of the teachers conferences. These conferences are valuable adjuncts to the convention. The officers are striving earnestly to prepare worth while programs. In some cases they are not receiving the cordial co-operation that should be given to them. Teachers must show their interest by attending the sectional meetings, and by participating in the programs as well, if these conferences are to be continued.

The Minneapolis committee, under Dr. Charles H. Rogers, Chairman, is making plans for an unusually fine convention, one that will make the 1938 meeting a memorable one. They should be rewarded by a record-breaking attendance and by enthusiastic sessions that will be unsurpassed in interest and value.

Hugh C. Muldoon.

Organization in Pharmacy a Great Need

Organization is the mother of movement. No group, it will be agreed, can progress without organization. What makes the will of a group effective is that unified action follows only upon close knit organization and with us pharmacists lack of organization is a weakness. Granted that this condition undoubtedly is due to diversity of interests it nevertheless has led on the whole to our present heterogeneous organizations. These are only loosely effective because all groups are intent on improving themselves in their own individual way and are hesitant about joining in a concerted movement embracing the entire profession.

It is evident that there is a definite need for a point of co-ordination of all pharmaceutical efforts if pharmacy is to make any noteworthy progress either locally or nationally. A factor of paramount importance which thus far has been

lacking in American pharmacy is professional loyalty. In no other field does one find such apathy toward the progressive advancement of one's chosen profession.

A major blame for the existence of this unhealthy situation may be placed on the colleges of pharmacy. They have not taken the educational advantages that is naturally theirs. What better place is there for inculcating the loyalty idea, sharing in a privilege adding to the honor and dignity of this great public health service profession through organization—than in these formative school years? At present many of our splendid men and women well grounded in a broad scope of sciences timidly admit that they have been trained as pharmacists. There seems to be an apologetic attitude permeating our entire profession. This should not be.

Throughout the entire four years of the pharmacist's college education he should be taught to take pride in being a member of this scientifically trained group of humanitarians. He should be well versed in the notable contributions to society by the renowned pharmacists of the world. Moreover, he should go forth to join his profession with a desire to add his bit to the work of Scheele, Serturner and Pelletier.

Such college graduates conscious of the privileges and obligations of their profession would constitute a group of men and women capable of unifying their efforts and thus become a powerful influence for better legislation, better living conditions and a better life.

Yet, if we are to face the problem squarely, such unification of loyalties, that powerful influence toward bettering living conditions and the better life, will remain for us an idle dream—or at best something desired but remote—until there is a complete and close organization of the pharmacists of America.

Leon W. Richards.

The Professional Pharmacy Degree

The adoption of the present constitution and by-laws of the American Association of Colleges of Pharmacy, providing that after July 1, 1938 the degree of Doctor of Pharmacy shall not be given for work in course, was a source of satisfaction to many engaged in pharmaceutical education. It seemed as if the degree question was settled for some time.

However, the October issue of the American Journal of Pharmaceutical Education states that at the last annual meeting, a committee on degrees urged that pharmacy adopt a specific professional degree and that a minimal course of five years be planned for such a degree and the degree granted be that of Doctor of Pharmacy. Since the recommendations were referred to the member-colleges for consideration during the coming year, it becomes the duty of all engaged in pharmaceutical education to express their views. Concerning the proposed degree, two questions may be considered: 1. Is there a legitimate need for a five, or more years course in pharmacy? 2. If so, is the Doctor of Pharmacy the logical degree?

In answer to the first question, a degree is a formal way of showing attainment. The Master of Science degree or the Master of Science in Pharmacy degree may now be given in course, which normally show five years of collegiate attainment, provided the requirements of standard graduate schools are fully met. Likewise, the degrees Doctor of Philosophy or Doctor of Science may be given for work in course, normally showing about seven years of collegiate attainment, provided the requirements of standard graduate schools are fully met. In the case of the five year degree, then, the only question would be, do we want to let down the requirements of the standard graduate school? If so, why should a student choose such a course when he could get a Master of Science degree in the same length of time? If a student does not wish to meet the requirements for the present five year degrees, and wishes to continue his studies, he now has the privilege of becoming a candidate for the Doctor of Philosophy or some similar degree. The only condition still not covered is the six year collegiate course. Does anyone see a great need for a six year degree in pharmacy at the present time? I do not.

If there is need of another degree in pharmacy, is the degree Doctor of Pharmacy the logical one? I can not see any more logic in such a degree than in a Doctor of Chemistry or a Doctor of Nursing for equivalent work in these respective fields or in other similar degrees in other similar scientific fields. If this is to be the modern trend in education and pharmacy wants to lead the way with this degree, the logic of this point is granted.

According to the Encyclopaedia Britannica, "Doctor" is "the title conferred as the highest university degree." If

we follow the recommendations of the Committee on Degrees, the only way the Doctor of Pharmacy degree could be made the logical one would be to make it the equivalent of a Doctor of Philosophy degree. If we want to do that, well and good. Otherwise, why not drop the matter and stop trying to fool ourselves as well as the public in general. Kenneth Redman.

As The Public Sees It

The Journal of the American Medical association, commenting on the elixir of sulfanilamide that is charged with the deaths of 61 persons, says: "Under our present laws the responsibility for protection of the public rests on the food and drug administration, which is as inefficiently armed as a hunter pursuing a tiger with a fly swatter." It is to be hoped that the medical association will remember this when revision of the food and drug act comes before congress again. Attempts to strengthen the laws in recent years have met with violent opposition, some of it from organized medical sources. All agree that the laws should be strengthened but there is a distinct unwillingness to compromise on the method to be used in bolstering the laws.—Editorial, Nebraska State Journal, March 1938.

Look To Your Library

The Editor wishes to call attention to the financial support that is being given this Journal by a number of firms that publish high grade texts and reference books covering the pharmaceutical science. Williams and Wilkins and P. Blakiston's Son and Company lists appear in this issue. The latter Company has placed an order for four consecutive issues and the McGraw Hill Company list will appear again in the October number. The Editor is of the opinion that the American Council on Pharmaceutical Education when it begins its inspection of American colleges of pharmacy will find the library one of the weakest points in many institutions. The immediate need is to strengthen our libraries with the latest books and journals. Read the New Book Section for the latest worth while books.

The Ohio Northern University is the first institution to support the advertising section. Rufus A. Lyman.

THE EDITOR'S PAGE

Who Speaks for American Pharmacy is the title of an editorial appearing in this number of the Journal written by Dean W. F. Rudd of Virginia. Editorials do not just drop out of the sky. They discuss matters of current interest and they are inspired by some event or some situation. The inspiration in this instance was a "Current Comment" appearing in the Journal of the American Medical Association for January 22 1938, entitled "Why Druggists Prescribe." The "Comment" caused some resentment among the increasing number of intelligent pharmacists who routinely read the Journal of the American Medical Association, not because they want to learn how to practice medicine but because they form an important bloc in the public health set up and they want to keep in touch with the trends in medical science. It is only natural therefore, for them to turn for this information to the official mouthpiece of organized medicine in America. When a pharmacist reads the Journal he expects to find expressed in its pages the best thought of the best men in the medical profession and in discussions which involve his own profession he expects to have at least fair treatment. In the "Current Comment" under discussion he finds neither. The writer quotes from a publication which is about as representative of the best thought in American pharmacy as the Brinkley publications are representative of the best thought in American medicine. Dean Rudd has expressed who speaks for pharmacy in no uncertain terms and in a dignified way. He shows no sign of malice toward the unknown author of "Current Comment." The Editor admires such fortitude in his pharmaceutical colleague in the face of such provocation.

The Editor, however, feels the injustice of "Current Comment" more keenly than does his pharmaceutical colleagues because it comes from his own profession. He happens to have been medically trained. He belongs to, and believes in organized medicine and he is proud of its accomplishments. Early in his career circumstances developed which have made his contacts in life as intimate with pharmacists as they have been with doctors. And after three decades of such contacts

he has yet to find an instance where a pharmacist has used a statement appearing in a trade medical journal (and there are many such) as expressing the sentiment, or the practice, or the idealism of the medical profession.

A great organized profession is much like a great nation. A nation finds itself in the hands of a certain group, or a certain individual in whom is centered tremendous power and therein lies the danger. The individual gets to thinking he is the whole nation and he not only sets standards of conduct for his own nation, but wants to set them for all other nations as well. The medical profession seems to have reached that stage in its growth, where it assumes that it is the only profession that has idealism and that it holds a commission directly from God, not only to set the standard for its own conduct, but for the conduct of all other professions. Any profession that assumes that attitude is in the same position that a national dictator is. In drawing a comparison I shall not refer to any modern dictator because no one knows just where these dictators will end. But in the case of dictators of an earlier generation it should be remembered that such conduct led Dictator Napoleon to a weary life on a barren isle, and it led Dictator Wilhelm to a woodpile.

Since the Editor can claim membership in the medical profession by training and in the pharmaceutical profession by adoption, he not only feels justified, but considers it his privilege and duty to give a bit of advice from the pharmaceutical point of view. The medical profession will do well to devote its attention to the controlling of the dispensing doctor. There is plenty of recent evidence to show he is quite as dangerous an individual as the prescribing druggist. The control of the latter individual is the problem of the pharmaceutical profession. We above all others are aware that he is a menace to the community in which he lives. He represents one of our major problems and we are using every possible means to eliminate him through a process of education and by inculcating into the minds of students of pharmacy a higher degree of responsibility and a finer type of idealism.

One of the finest tributes that can be made to the thoughtful men of the medical profession is that they have recognized the need of a conference of professional men where common

problems can be discussed in open forum and the suggestion for such a conference came from Dr. William D. Cutter of the American Medical Association. Such a conference has been established by the American Council on Education and one of the problems it has before it now for study and discussion is "How may the ethics of the profession be promoted?"

But aside from this "Current Comment" incident the Editor has a grievance all his own. It seems almost pueril that a mature man should become infuriated over such a simple matter as a book review. But that is exactly what has happened. The review appears in the March 5th number of the *Journal of the American Medical Association*, page 764. The book reviewed is Barber's *Physiology for Pharmaceutical Students*. After complimenting the book highly, which it deserves, the reviewer concludes with these lines: "It must be regretfully admitted that there are few if any pharmacy schools in this country that give their pupils any such comprehensive course in physiology. Indeed, even the text in its general comprehensiveness would probably be "beyond" the comprehension of the average student in our pharmacy schools at present." The Editor wishes to suggest to the official of the American Medical Association whose duty it is to select reviewers of texts that when he selects a reviewer to review a text written for students of pharmacy that he, out of justice to colleges of pharmacy and to students of pharmacy, he choose a reviewer who has some knowledge of the curricula of colleges of pharmacy, and what is more important, one who knows something about the quality, the ability, the capacity, and the intelligence quotient of the present day pharmaceutical student. The Editor was about to sling at that unknown reviewer, the worst epithet permissible for a Presbyterian elder to use, when he was interrupted by the arrival of the morning mail. Nervously he broke the seal of a Western Reserve envelope expecting to find a two dollar bill; instead, these lines met his eye: "Can you as Editor recall who wrote these lines?—

'In men whom men condemn as ill,
I find so much of goodness still,
In men whom men pronounce divine,
I find so much of sin and blot,
I hesitate to draw the line,
Between the two where God has not.'
Edward Spease."

With this gentle rebuke from his spiritual adviser, the Editor rests his case and turns his attention to other things, feeling perfectly confident that even before a jury of medical men his reasoning will receive fair treatment.

Space does not permit but a brief mention of some of the important papers in the current number. Professor Ernst T. Stuhr's study of the Foreign Educational Requirements for the Study and Practice of Pharmacy are interesting when compared with our own standards. The article on the Teaching of Galenical Pharmacy by Dr. Svend Aage Schou of Copenhagen, Denmark, will be of special interest to teachers of pharmacy, not only because it gives the continental viewpoint but the international significance. Preliminary to the revision of the basic biological science section of the Syllabus Dr. R. A. Deno is making a study of the present extent and methods of teaching the basic biological sciences in our colleges of pharmacy. This is a Problems and Plans Committee project and his article upon this subject in the current issue should be read by all interested in biological teaching. Permission was granted by the Scientific Monthly to publish the study "What is a Patent or Proprietary Medicine" by Robert P. Fischelis in this Journal. This article has been referred to by many pharmaceutical educators as being a masterful study of the subject which should be brought to the attention of the college group.

When the Editor requested the deans of the colleges through the mail to express their opinion upon the wisdom of publishing a list of the subscribers to the Journal in its pages he had no thought of coercion as is indicated in so many replies in Gleanings From the Editor's Mail. Rather, did he have in mind an honor roll made up of those who had been thoughtful enough to pay their renewals. As a small boy he got the idea from his country school and his Sunday school teacher when the one wrote his name on the blackboard because he had caused her no inconvenience and the other had given him a picture card assuring him he was a little bud of promise for having behaved so nicely in Sunday school. Anyway, he did not print the names and some deans paid up.

Events do occur for which no words have been coined in any language that will bring comfort to those affected and if one tries to say what he would like to say the words seem

to him but hollow mockery. Such an event has occurred with the passing of Mrs. Ivor Griffith. To Dean Griffith and to the daughters we bring the sympathy of those who have passed through a like experience. There are no words that can assuage the pain but there is the triumph of a glorious Easter morning that brings hope and gladness, and turns tears of sorrow into tears of joy. That hope, Dean Griffith, we bring to you and to your daughters.

It was the day after the Christmas of December, 1937. Shadows of the early winter evening had begun to settle upon the black farm lands of northern Illinois. A gigantic Burlington engine was smashing its way eastward toward the city of Chicago with the fleetness, the brilliancy, and the roar of a mighty rocket. The Editor was comfortably seated on that train experiencing the majesty and power of the unseen turned into activity, when a fellow traveler in a forward seat unfolded a Chicago Herald Examiner and a headline in bold black letters met the Editor's eye. It read NEWTON D. BAKER IS DEAD. With the reading of that legend the Editor's mind and memory took to the air, backward to 1922 in time and forward in space to the city of Cleveland. He found himself seated in a convention room in a Statler hotel. A man, small in stature, but dignified in appearance, walked up the aisle. He was presented to the group, constituting the American Association of Colleges of Pharmacy, as Mr. Newton D. Baker, former Secretary of War in the Wilson Administration. The man whose last accomplishment had been to move four million men to France when he had no boats to move them. To equip four million men with arms, when there were no arms to equip them. When the war was over and there were no boats to bring them back, he equipped and conducted a great American university for them in France, so that when he could get them home they would be better equipped to meet the problems of civil life. He brought them back and then he took up the routine of his own profession as if nothing extraordinary had transpired. Newton D. Baker was the first guest speaker the Association had. For thirty minutes he talked about the problems of pharmaceutical educators and pharmaceutical educators as intelligently as if he were talking about the problems of his own profession. Finally he said, "I have said all that I came

here to say." He took his hat and walked out as unostentatiously as he had come in. Most of what he said I have left to his friend, Dean Edward Spease, to say on another page. In his final statement he pled that pharmaceutical educators should recognize the importance and "dignity of their relation to all education." That when young men and women bring their natural endowments to you to be trained, you have not done your whole duty unless you instill into them "sympathies of a broad and general character" and "infect them with the consciousness of the fact that they are citizens and have great duties in that regard, and underlay all their faculties with a broad ethical and moral basis showing that character is the rock upon which success and usefulness must be established, then pharmaceutical education will assume and maintain the same dignity in the great collection of educational faculties which are attained by other sciences."

The sentiment expressed in these words, not only became ingrained in the minds and hearts of his audience, they have become the goal for which the American Association of Colleges of Pharmacy is striving.

The Burlington Aristocrat came to a standstill under the flood lights of the Union Station at Chicago. As I passed by that magnificent power house known as Engine Number 5619, that had brought me out of the darkness into light, I felt the urge to bare my head in the presence of that almost living thing that had safely carried me to my destination. As I stood there admiring its latent power, the thought came to me, how much Engine Number 5619 was like Newton D. Baker, except the soul of the man was the engine's master, and as I turned to enter the station the panting engine seemed to be shouting after me, "Newton D. Baker is not dead: NEWTON D. BAKER LIVES."

Rufus A. Lyman.

Professor Lawrence H. Baldinger of the Department of Pharmacy of Notre Dame University has made a list of duplicate journals possessed by that institution and he will be glad to send them to any school that needs them. This is a worth while and gracious thing to do and it is hoped other schools will do likewise. Exchanges can be made to great advantage. Make your library stronger.

The Editor.

Gleanings from the Editor's Mail

I was very glad to receive your letter dated January 22, 1938 and Volume 1 of the American Journal of Pharmaceutical Education and I thank you very much for them.

We were much interested in the Journal and found the different articles dealt with, of great help to pharmaceutical education and will be very glad to have it in our college library.

I send you herewith a check for five dollars, my subscription fees for Volumes II and III.

I should be very glad to supply you with any information concerning pharmacy or pharmaceutical education in Iraq, which your Association might be in need of.

March 19, 1938.

Fouad Stephen
Royal College of Pharmacy
Baghdad, Iraq

This mail has brought me the first number of Volume 2 of your new Journal. I looked it over with great interest. Even to one not familiar with the field, the discussions of Dille and other items are evidently valuable findings of careful, intellectual study in this field.

I read the first page from Mr. Lascoff with great pleasure. You certainly deserve congratulations and thanks for the fine work you are doing and I wish you continued success in the field.

HENRY B. WARD
University of Illinois

I have about concluded perusing the January issue of the American Journal of Pharmaceutical Education. I agree with you that much remains to be done to improve our undergraduate courses, but I am even more anxious to see a phase of non-curricular pharmaceutical education improved. I refer to "drug store experience." As I pointed out at the Cleveland meeting of the American Pharmaceutical Association in 1922, the professional pharmacists (not the drug, soda and cigar merchant) can have the pick of high school boys and girls if they cooperate with the colleges in a renaissance of the former apprenticeship, provided, naturally, that the colleges cooperate with them.

Such a cooperation between pharmacies, recognized by the boards as pre-college training schools, and the colleges will enable the latter to eliminate much of the A, B, C, of pharmacy and devote the time thus gained to subjects worthy of the attention of maturer young men and women.

At our last Washington meeting when we discussed the requirements of the under-graduate curriculum, it was agreed unanimously that all subjects should be of collegiate grade, no one present dared to respond. Not only should the A, B, C of pharmacy be taught to boys and girls of fourteen to eighteen, but other subjects not of collegiate grade should be crowded backward. Besides those mentioned, elementary languages should be taught in high school. Such a revision of pre-

collegiate education and training would have room for the desired improvement of our under-graduate years at college.

My remarks do not apply to the period of probation after graduation. This period of internship is a problem by itself.

EDWARD KREMERS
University of Wisconsin.

With reference to the question of whether the entire list of subscribers should be published in the Journal, in my opinion, I doubt the advantage. Every professor in a College of Pharmacy should be sufficiently interested in his profession to subscribe to our educational Journal. A letter to the deans should be sufficient to bring up the subscriptions to practically one hundred per cent. At least each full time professor should subscribe to the Journal.

I appreciate the value of the Journal for the advancement of pharmaceutical education. It should have been started years ago and now that we have it going, we should lend every support to make it an outstanding success.

A. O. MICKELSEN
North Pacific College of Oregon.

Although I am out of actual teaching, I do wish very much to keep in contact with the teaching profession, so I am renewing my subscription to the American Journal of Pharmaceutical Education.

I have enjoyed the publication a great deal in the past year and I want to wish you continued success in this very worth-while undertaking.

RUSSELL A. CAIN
Assistant Director Pharmaceutical Laboratories
Sharpe and Dohme.

With reference to the question that you ask concerning the policy of printing the entire subscription list in the Journal, I am of the opinion that it probably is a little early in the life of the Journal to take such action. Would it not be better to mimeograph a sheet with a list of colleges that have subscribed together with the number of subscriptions from each college and send this to those colleges who have not subscribed, calling it to their attention and soliciting their support? By doing this the list of colleges that have not subscribed would not be made as generally public as by running the list in the Journal and, hence, should not antagonize those colleges. Probably a letter from the Editor to accompany this list might help in emphasizing the need for support and the advisability of cooperating in this venture.

We shall be glad to mention the Journal in our dealing with advertisers in the Journal.

B. V. CHRISTENSEN
University of Florida.

I want to assure you that I mean every word of my greetings to the Journal, and I promise that I will fight to the end these so-called one-year schools which are such a detriment not only to the other schools but to the profession of pharmacy as a whole.

J. LEON LASCOFF
New York City.

We will do all we can to have subscriptions sent you by members of our staff. I am glad you are getting some advertisements from the publishing companies. This is good business.

I am heartily in favor of publishing, say in the April issue, a list of colleges with subscriptions from each, as suggested in your letter.

WORTLEY F. RUDD
Medical College of Virginia

The Editor's Mail Bag is indeed one of the most interesting sections in the Journal. Perhaps one of the reasons is that you do not allow writers to edit their letters which results in a ruggedness even if they are not polished. Deno's letter should certainly make the section improve. I, myself, as I look back on the presentation of that paper, think that a few policies might be developed for guiding those who present papers. Some such policies were presented to the scientific section some time ago. But they stated that authors should not read papers but should present them extemporaneously following a logical plan which should be carefully considered beforehand so that all of the material to be given could be presented in the time allotted with the proper proportions of attention given to each part of the research. This would be a very fine thing. But you cannot set up policies of this sort for research workers. The papers they write and their presentation are just as individual as they, themselves.

Recently Doctor Klemme sent an extensive program to Dean Johnson regarding a proposed study of the aptitude of students entering pharmacy. Being an old teacher's college graduate, I was very much interested in the proposed study. I think it will be a great thing, but I believe a lot of men in pharmacy do not understand the methods or limitations of aptitude testing. The first thing to be done in the setup of such a test is the determination of what the finished product should be. It seems to me this is almost an impossibility in the case of a pharmacist. Perhaps you still have in the pharmacy laboratory that big chart showing a chain of forty or fifty qualifications of a pharmacist. Assuming that pharmacists as whole consist of these individual parts, aptitude tests would have to be made for each one of them. Aptitude tests can only test specific qualities and I think there are so many of these in a pharmacist that it would be almost impossible to determine them, let alone set up tests for them. Now in the case of a pharmacologist, the situation might be different because here the finished product is much more specific and I feel sure that it would be possible to set up an aptitude test which would test the half dozen or so qualifications that are necessary for a pharmacologist.

JAMES M. DILLE
University of Washington.

In reply to your inquiry concerning publication of a list of subscriptions to the Journal, I must confess that I do not know whether the conditions which you mention are due to carelessness or to lack of the necessary funds. I am very sincere when I say that many who may be accused of being careless and insincere are actually pure at heart. Their pride causes them to hesitate to confess their poverty.

RUDOLPH H. RAABE
Ohio Northern University

I see nothing wrong in having the entire subscription list in the Journal, college by college. It would at least show us what schools are supporting the Journal. I have also noted the various advertisements of books and will follow out your suggestions with regard to calling the company's attention to the advertisement. I believe in the idea of notifying the book companies, whenever we order books, that the advertisement was noted in the Journal, will be an incentive for them to continue supporting the Journal. As we all have to purchase books, it is really a help to know that we can find the list in the Journal.

C. E. MOLLETT,
University of Montana.

I have no objection to your printing the subscription list by colleges if you think it will be of any advantage in stimulating interest in those institutions who have paid little or no attention to your efforts. The Journal is certainly worthy of support and under normal conditions, I would not hesitate to urge a subscription from each of our teaching staff.

E. R. SERLES
South Dakota State College.

Enclosed please find my \$2.00. This is about all I have been doing since January first, writing checks, paying bills, and subscribing for something. But of course, The American Journal of Pharmaceutical Education is the most valuable thing that I get.

I have been far from satisfied with the support which you have received from Cleveland. I sincerely hope that I can persuade more to rally round. I am inclined to think it to be a good scheme to print the entire subscription list in the Journal. Every member of our teaching staff can afford to be upon your list and I am inclined to think that is true of most of them.

EDWARD SPEASE
Western Reserve University.

I am trying to interest the academic men in the Journal (they are not pharmacists) because I believe it will help them understand our problems. Then, too, many educational difficulties are the same, regardless of the field, so it is possible that we may learn from their bringing to us a fresh point of view.

EARL P. SLONE
Louisville College of Pharmacy.

During the past few weeks I have had occasion to examine very carefully the five numbers of the American Journal of Pharmaceutical Education which have been issued. I have read the various contributions with much pleasure for, as you know, I have an abiding interest in pharmacy. Although at present I am not immediately identified with the work of our College of Pharmacy, never-the-less its activities and progress are followed very closely. It appears that your Journal is serving a very helpful purpose in keeping before pharmaceutical educators and the profession as a whole, present-day problems and trends. I congratulate you as Editor upon the splendid work you are doing.

EDWARD H. KRAUS
University of Michigan.

I am a bit in doubt about the wisdom of publishing a subscription list by colleges. Would you not accomplish what you wish by publishing the subscription list alphabetically with the name of the college after the individual?

When this Journal was launched there was no thought in my mind, and I doubt that there was any thought in the minds of the other members of the Executive Committee that we would attempt to force people to subscribe to the Journal. Of course, we sincerely hoped that the colleges would support it. If they are not supporting it, I think any attempt on our part to point our finger at them will alienate any kindly feelings they may have toward that Journal. However, in this I may be wrong and I will be glad to accept your judgment in the matter.

C. B. JORDAN

Purdue University.

You have done such a splendid job editing this Journal that certainly the schools should give one hundred per cent support.

It appears to me that it would be a good idea to publish the entire subscription list in the Journal, college by college. I have discussed this with several of my colleagues and they seem to be of the same opinion.

I was pleased to have you call my attention to the full page advertisements that are appearing from the two book companies, and if the occasion arises, all of us will refer to the Journal when we take up matters with the companies involved.

R. A. KUEVER

University of Iowa.

In reply to your letter of January fifteenth, I shall give personal attention to the matters you mention and expect increased support for the Journal from our faculty.

Publish the list of subscribers,—and watch it grow.

You are making a good job of the Journal and deserve better support. Call on me when I can help.

H. EVERT KENDIG

Temple University.

In regard to your question about printing the entire subscription list in the Journal, college by college, I feel that the names of the members of different pharmaceutical faculties would be conspicuous by virtue of their absence. This is a mild coercion which, in this particular case, may be justifiable. I am frankly surprised that men engaged in educational work feel that they can afford to be without this Journal. There may be extenuating circumstances, however. In my own faculty, for example, I know of at least two or three who simply must keep their expenditures within their incomes. There are so many demands made upon them that they have felt that they must deprive themselves of some things and apparently the Journal was one of these things.

Your suggestion that we show preference to advertisers in the Journal is a good one. Whenever it is consistent to do so, you may be assured of our cooperation.

CHARLES H. ROGERS

University of Michigan.

We shall be very glad to carry out your suggestion and mention the Journal when writing advertisers, particularly those book publishers you name.

I approve your suggestion in regard to publishing the names of subscribers to the Journal. Our State Pharmaceutical Association publishes a monthly journal. For the past two years they have published the names of subscribers, and at present the list is the largest in the history of the Association.

EDWARD H. NILES
Indianapolis College of Pharmacy.

I do think it a good idea for you to print the list of subscribers by institutions, and go further and say after each of the member colleges whose faculties have not subscribed something like the word NONE. Of course, it will follow in institutions like ours that only the numeral 4 can be used even though every member of our pharmaceutical staff has subscribed, where as in colleges like Philadelphia, Massachusetts, etc., the same numeral would embrace only about one-fifth of the staff.

From the very beginning of the Journal I have advocated a policy of accepting advertising from firms who grace our profession. After all it is the character of the reading matter that is found in the Journal that will be judged as good or bad. There should, however, be some limitation on the number of advertising pages carried, this to be determined by you as editor. You could beforehand solicit advertising from reputable firms until the maximum number of pages is secured and then be in a firm position to refuse additional would-be advertisers on this ground.

Sometimes we fail miserably in not living up to such high professional standards as medicine, etc., and again, inconsistently, we conclude to be as clean as the stars. I believe in professional ideals heartily but I subscribe more to ethical or moral practices. The Journal has a mission, a fine mission that must be fulfilled. But all missions have to be financed adequately if they are to serve their highest purpose. Since your funds are inadequate and until the publication is subsidized properly, I cannot see how the proprieties will suffer if decent firms in limited number are permitted to use Journal pages for decent publicity.

J. GROVER BEARD
The University of North Carolina.

I have received your letter of January fourteenth and hope that your letter will bring a prompt response in the form of renewal of subscriptions to your Journal. I will bring the matter before our own faculty at our meeting tomorrow, but I hope that we are not included in the list of those who have not supported the Journal. According to my recollection, last year we were very loyal, at least fifty per cent of our faculty having subscribed.

You raised the question of the publication of the subscription list. As a matter of policy, it seems to me that this savors too much of coercion and might be interpreted in this way rather than as a stimulus. It seems to resemble too much some of the campaigns, non-scientific in character, with which we come in contact every day, and personally, I

would hate to see it carried over into our own Journal, unless it seems to be a last resort.

Dr. Soule reported very favorably on your program and the joint program at Indianapolis. It was a great pleasure to learn that the Indianapolis meeting was so successful from the standpoint of our own group.

HOWARD B. LEWIS
University of Michigan.

AN OPEN LETTER TO DR. MORRIS FISHBEIN

Dr. Morris Fishbein
535 North Dearborn Street
Chicago, Illinois

Dear Doctor Fishbein:

The retail druggists constituting the boards of pharmacy and the pharmaceutical educators representing the colleges of pharmacy in the Fifth District (States of North and South Dakota, Minnesota, Iowa and Nebraska) make up a fairly representative cross section of professional pharmacists and pharmaceutical educators of America. This group meeting in annual conclave at Des Moines, Iowa beg to inform you of their displeasure at the trend of the articles recently appearing in the editorial and current comment columns of the Journal of the American Medical Association relative to the practices of retail pharmacists.

These articles are unfair to pharmacy and pharmacists in that they attempt to lay at the door of pharmacy the blame for the "sulfanilimid incident", when the facts shows that the blame for the majority of deaths rests upon the dispensing doctor rather than the druggist. Furthermore, recently there appeared in the Journal an article on "Why Druggists Prescribe" in which the author has used as a basis for his argument, a statement made in a purely commercial trade journal, that is not the mouthpiece of any group of organized pharmacy and which does not represent or express the thought of professional pharmacy.

Organized pharmacy recognizes its shortcomings. It has them just as organized medicine has them and is putting forth every effort to correct them and we consider it deplorable that the official mouthpiece of organized medicine should permit its columns to be used to exhibit to the medical profession and the public as typical of pharmaceutical endeavor, those things that professional pharmacy is using every means in its power to correct.

Pharmacy occupies a position in relation to public health, safety and moral welfare, which is second to no other profession and we wish to assure you that we are aware of our responsibility. Furthermore, we will welcome constructive criticism in the interest of public health at all times and from all sources, but statements which are untrue and misleading both to the medical profession and to the public do not constitute constructive criticism.

Very sincerely yours,

R. A. KUEVER, Chairman Fifth District Colleges of Pharmacy.

E. C. SEVERIN, Chairman Fifth District Boards of Pharmacy.

Sent to Dr. Fishbein under date of April 8, 1938.

Notes and News

Dean R. A. Kuever of the College of Pharmacy, University of Iowa, recently addressed the Baconian Society of the University upon *Newer Aspects of Drugs and Medicines*. He spoke also to a group of alumni on February 25; the occasion being the anniversary of the founding of the University.

Dean Emeritus Wilber J. Teeters in December spoke at a joint conference of the County Attorneys' and Sheriffs' Association at Des Moines and Professor Louis C. Zopf spoke to group 4 of the Iowa Pharmaceutical Association on *Better Displays for Pharmacy*.

The laboratory instructions for pharmacognosy prepared by Dr. Ralph Bienfang for and used in the University of Oklahoma were published in July-October, 1937 issue of the *Revista de Pharmacia e Odontologia*, Niteroi, Brazil, under the title "*Esbocos de Pharmacognosia*".

Dean A. G. DuMez, School of Pharmacy, University of Maryland, on March 16th addressed the League of Women Voters of Baltimore on the *Growing Menace of Marihuana*.

The School of Pharmacy of the University of Oklahoma has a unique undergraduate organization known as the Oklahoma University Pharmaceutical Association which is planned along the lines of the American Pharmaceutical Association. There are four sections, practical pharmacy and dispensing, commercial, scientific and historical with a full set of officers. It holds an annual convention with a full day's program including the general session, sectional meetings and programs given by and adapted to the student needs and includes entertainment features. It certainly is a commendable undertaking for the training of the undergraduate in association and organization work.

During the month of February Professor E. E. Roscoe of the College of Pharmacy of the University of Idaho spoke before several forum groups on the subject of narcotics in general with special emphasis on marihuana.

Dean Emeritus Frederick J. Wulling of the University of Minnesota delivered the layman sermon on *Laymen's*, Sunday, March twentieth, in the Church of The Redeemer at Minneapolis.

Dr. C. F. Poe, College of Pharmacy, University of Colorado, spoke before the South Denver Civic Association on February tenth on *Drug Adulteration and Drug Legislation*. Dr. Poe has also recently been appointed on the Board of Examiners for Colorado in the basic sciences. Dr. Poe and Dr. E. M. Plein recently published an article on the "*Determination of Camphor in Alcoholic Solutions—Dinitrophenyl-hydrazine Method*" in the Analytical Edition of the *Journal of Industrial and Engineering Chemistry*. Dr. George L. Baker, a former graduate of

Colorado has recently been made Dean of the College of Pharmacy at the University of Toledo. Mr. Fred Drummond has been added to the teaching staff of the College of Pharmacy, University of Colorado, taking the place of M. David O'Day who is on leave for graduate study at the University of Iowa.

Dean Edward Spease of Western Reserve gave a lecture on Food and Drug Legislation to the Cleveland Woman's Club in March and in April a lecture to the Cleveland Dental Society at its April meeting.

The date for the Fairchild Scholarship examination has been set for June 13 and 14 inclusive.

Dr. L. D. Edwards of Western Reserve, on March 11, presented a paper on the Hemolytic Values of Soap before the Cleveland Section of Experimental Biology and Medicine.

At the annual open house program of Western Reserve, the School of Pharmacy made an exhibit consisting of a prescription display and technique involved, a manufacturing laboratory and a hospital pharmacy display including sterile solutions, professional stores and the outpatient pharmacy. The pharmacognosy exhibit included a display of microscopic sections of animal and plant tissue and a collection of crude drugs grown at the Squire Valleeview Farm.

Because of other work Dean Edward Spease and Dr. H. A. Langenhan have asked to be relieved from service on the Committee of Professional Relations and the Syllabus Committee respectively. Professor Neil T. Chamberlain has been named to take the place of the former and Dean Howard C. Newton the latter to serve until the next annual meeting.

Mr. C. W. Bell of the faculty of the School of Pharmacy of the University of Georgia has joined the staff of the Bilhuber-Knoll Corporation of Jersey City.

Dr. Frederick F. Johnson, Assistant State Chemist of Washington, and son of Dean C. W. Johnson of the College of Pharmacy of the University of Washington has accepted a research fellowship at the Mellon Institute of Industrial Research at Pittsburgh.

A prescription symposium for the pharmacists of Iowa was given at the University of Iowa on March twenty-fifth. This symposium was given under the auspices of the College of Pharmacy and has as its purpose the intensive analysis and study of the prescription department of the store. In carrying out the program the faculty had the assistance of many outstanding druggists of the state.

An outstanding feature of the Centennial Celebration of the Medical College of Virginia on February seventeenth was a pharmaceutical symposium. Distinguished speakers who took part in the program were Dr. I. C. Riffin, State Health Commissioner of Virginia who spoke on the Pharmacist and Public Health; Mr. Eldon Roberts, Jr., whose subject was The Practice of Professional Pharmacy, and Dr. J. Leon Lascoff of New York City who discussed The Pharmacist and the Physician.

The first attempt of the Division of Pharmacy of the South Dakota State College to give a continuation course to the druggists of the state was made at Brookings on February twenty-first to twenty-fourth inclusive. Cooperating with the teaching staff of the Division were representatives of the Department of Entomology and Veterinary Medicine, who presented information to the druggists as to the newer developments in their respective fields which would make it possible for them to enlarge their professional services to the physicians and to the public. Thirty appreciative proprietors attended. Mr. Nicholas Solonen, a graduate of the University of Iowa has been added to the teaching staff taking the place of Mr. L. D. Hiner who is on leave for graduate study.

The Board of Trustees of Howard College of Birmingham has instituted a campaign to add a quarter of a million dollars to the endowment of the institution by the year 1942, when Howard will celebrate its one hundredth anniversary. The School of Pharmacy will share in this development.

Dr. Ivan C. Berrey has been appointed lecturer on first aid in the School of Pharmacy of Howard University of Birmingham, Alabama.

On January twenty-fifth, Dean H. C. Newton, Dr. C. W. Bauer and Professor L. M. Ohmart discussed Newer Aids in Filling Prescriptions before the mid winter meeting of The Connecticut Pharmaceutical Association. Dean Newton, Professor Ohmart, Dr. H. W. Younken and Dr. E. V. Lynn gave a symposium on Teamwork in Pharmaceutical Research at the meeting of District No. 1, at Providence, Rhode Island. Dr. Bauer spoke before the New England Association of Chemistry Teachers at the January meeting. An article on the Trend of Chemical Education in Pharmacy by Dr. Lynn appears in the 1937 report of the same association.

Professor F. E. Marsh, Creighton University, College of Pharmacy, in March spoke on Immunology before the district meeting of the Nebraska Pharmaceutical Association at Fremont and to a number of civic groups on the subject of Marihuana.

Dean J. F. McCloskey of Loyola University, College of Pharmacy reports that in the vocational guidance work in the New Orleans high schools, where four years ago when pharmacy was first introduced to the group, only three students reported as interested in pharmacy as a vocation, this year more than forty reported.

Dean H. S. Johnson, Professor H. J. Fuller and Mr. N. W. Fenney of the Connecticut College of Pharmacy gave a series of demonstrations in pharmacy during March for the students in pharmacology in the Yale Medical School. A new course for seniors in the Connecticut College of Pharmacy has been inaugurated. It consists of a series of fifteen lectures given by prominent retail druggists, public health officials, scientists, and medical men from Yale University Medical School.

A new laboratory equipped for alkaloidal assay has been opened at the School of Pharmacy of the Washington State College.

On March fourteenth Dean Ernest Little of Rutgers University spoke to the students of Purdue suggesting the formation of a student branch of the American Pharmaceutical Association. On March fifteenth he addressed the Chicago Branch of the Association and the need of maintaining a strong national organization in which all interested in the welfare of pharmacy may have a part.

Director J. L. Hayman, University of West Virginia, spoke in January before the Monongalia County Medical Association on Professional Relations Between Physicians and Pharmacists and in March to the Elkins Rotary Club on History of the Fair Trade Act. On April eighth he discussed the Use and Abuse of Narcotics before the Women's Club of Morgantown. Professor G. O. Bergy in February spoke to a group of high school seniors on the General Applications of Cosmetics.

The Philadelphia College of Pharmacy observed the one hundred seventeenth anniversary of Founders' Day on February twenty-third. An outstanding feature of the program in Philadelphia was the awarding of honorary degrees to Mr. Theodore Weicher of E. R. Squibb and Sons for his years of service to the cause of professional pharmacy and to Dr. Edward J. Hughes of Eli Lilly and Company for his work in the improvement of pharmaceutical standards and manufacture. Gatherings of alumni were held in many cities celebrating the event.

On February sixteenth Dr. Paul J. Hanzlik, Chairman of the Department of Pharmacology of Stanford University was the joint guest of the College of Pharmacy and the Society of Sigma Xi of the University of Nebraska. He gave two lectures before the College of Pharmacy on Antitoxic and Protective Action of Dyes and on the Oral Treatment and Control of Syphilis with Sobisminol, a new Bismuth Compound. Before the Society of Sigma Xi he spoke on Purkinje's Pioneer Self-Experiments in Psycho-Pharmacology.

Mr. H. C. Christensen, Secretary of the National Association of Boards of Pharmacy has been declared the recipient of the 1933 Remington Medal in recognition of his long period of service and his outstanding achievements for the profession of pharmacy.

The nineteen thirty-six and nineteen thirty-seven graduating classes of Howard College, Birmingham, have each established a thousand dollar fund for the benefit of the pharmaceutical division of the institution.

Dr. Harald G. O. Holck of the College of Pharmacy of the University of Nebraska has recently been elected to membership in the American Society of Pharmacology and Experimental Therapeutics. At a meeting of the Federation of American Societies for Experimental Biology at Baltimore March 30 to April 2, Dr. Holck presented the results of his experiments with the collaboration of E. L. Smith upon the difference in the bioassay of digitals under the influence of various anesthetics.

Dr. James Madison Dille of the Department of Pharmacology of the College of Pharmacy, University of Washington, was recently a guest of the College of Pharmacy, the University of Nebraska. On March 22, he spoke before the faculty and students concerning his studies upon the elimination of picrotoxin.

MISCELLANEOUS ITEMS OF INTEREST

A MEMORIAL

NEWTON DIEHL BAKER

With the passing of Mr. Baker at his home in Cleveland on December 25th, 1937, pharmacy sustained a real loss. While he was particularly interested in the field of adult education he also was thoroughly acquainted with the broad general field of professional education and knew the difference between professional education and training.

He was long a trustee of Western Reserve University and chairman of its board for five years prior to his death.

His interest in education was undoubtedly life long. His especial interest in adult education was stimulated by his experience with our army abroad at the close of the World War and his grasp upon the field of pharmaceutical education became apparent while he was Secretary of War. Upon his return to private life he immediately made it his business to learn more about this special field.

Before his return from Washington he became one of a committee of three of the board of trustees of Western Reserve University whose especial trustee duty was that of the School of Pharmacy.

It seems fitting that we in pharmacy should claim somewhat of his memory for our own and upon the pages of our educational journal pay tribute to him.

A few selections from his advice to us in 1922 should be repeated here, not only for the purpose of showing his grasp of our relationship to public needs but also for the purpose of keeping before us principles which will be as essential to us one hundred years from now as they were upon the day he uttered them.

Mr. Baker said: "... Young men and young women come to you to be educated in a specialty. Obviously, so far as that specialty is concerned it is of the highest importance that that educational subject should be soundly given. But if you educated them into perfect pharmacists and left off there, so that they had no contact outside of the narrow circle of the science in which you instruct them, they would not yet be equipped for life, and so the duty upon you as educators, is to find out where the most fruitful contacts are between a well given pharmaceutical education and the rest of the education which is necessary for a rounded and useful, and therefore happy life on the part of those who are the graduates of your institution."

He said of the diploma: "... The process of fitting that diploma to life is probably the most critical and discouraging experience the young have. You can make it easier to fit the diploma if, instead of having your pharmaceutical education a round education, you have it with antennae (so to speak)—arms that reach out and touch with sympathy the related branches of learning, and that is especially interesting to pharmacists because, after all, pharmacy is a kind of

half-way house between research in pure chemistry, and the application of chemistry by the medical profession.

"You are just in the middle—the research man discovers and the engineer carries it into practice but the pharmacist is mid-way between those two, and if your students could have a real, live sympathy with the scientific problems of pharmaceutical chemistry and some sort of sympathetic understanding of the problems which the internal medicine doctor has to deal with—if he could see his own problems from those two points of view he would be a more useful pharmacist."

" . . . Sometimes I think the pharmacist has a special obligation as a citizen. He usually has his store on the corner and it is a place where the neighborhood gathers. If he is a man of firmness of character and knowledge, he gets to be a man of influence quite without knowing it because he is in the center of a village community. This is of the highest importance that, among the subjects with which you seek to inspire your students, shall be those great public subjects—political questions, if you please—in which the common good is to be worked out by co-operation of citizens.

" . . . There is probably no other profession in which the ethical content is so necessarily high as it is in the pharmacist's profession. For a variety of reasons, which you will understand without my enumerating them, the druggist has control of a great set of agents which the weak and frail members of society seek to acquire to misuse, and unless the pharmacist be a man who has a very high moral purpose, unless he can see straight and think clear, he is likely to be a danger to himself and his community.

" . . . What I came here to plead for was that the pharmaceutical faculties should recognize the dignity of their relation to all education, for in this selective age, when it is no longer possible to know everything, the force of circumstances requires that a certain number of young men and young women shall bring their natural endowments to you to be trained. If you give them a limited perspective and unsympathetic education and unenlightened skill, merely, then you have not done your whole duty by that priceless thing which those young people have brought to you to be trained, but if you give them contact with liberal and enlightening things and if you give them sympathies of a broad and general character, if you infect them with the consciousness of the fact that they are citizens and have great duties in that regard, and if you underlay all of those faculties with a broad ethical and moral basis, showing that character, after all, is the rock upon which both success and usefulness must be established, then pharmaceutical education will assume and maintain the same dignity in the great collection of educational faculties which are sought for and attained by other sciences."

EDWARD SPEASE.

Excerpts from the Minutes of the American Council On Pharmaceutical Education

To the Members of the Council:

Item No. 23—Minutes of the Ninth Meeting of the Council. The ninth meeting of the Council on Pharmaceutical Education was held at the School of Pharmacy of the University of Maryland, Baltimore, Maryland, on March 5th, 1938.

The meeting was opened at 9:30 a. m. with the following members present: Messrs. Kelly, Christensen, Swain, Taylor, Jordan, Leigh and DuMez. Dr. David A. Robertson, the representative of the American Council on Education, was in attendance in the afternoon.

A. Report on Applications and Questionnaires. Secretary DuMez reported that information supplied by the state board of pharmacy indicates that there are 76 colleges of pharmacy (including cram schools and quiz schools) operating in the United States proper at the present time. Of this number, applications for accreditation were received from 43 colleges. A total of 35 had completed the questionnaires and sent them in. The deans of two colleges had written that they desired inspection whenever convenient for the Council but they had not sent in the completed application blanks or questionnaire forms to date. Of the total of 45 colleges requesting accreditments, 16 expressed the desire that inspection be deferred until late in 1938 or until 1939. Of the 45 colleges requesting accreditments, 39 are members of the American Association of Colleges of Pharmacy and 31 of these had completed the questionnaires and returned them.

B. Instruction for Guidance of Inspection Committees. The type-written copy of instructions for the guidance of inspection committees prepared by Secretary DuMez was discussed in detail and amended to meet the views of the Council. Attached are the amended instructions which were adopted on motion by Dean Leigh, seconded by Dr. Swain.

C. Examination of Questionnaires. The Council sitting as a whole reviewed several of the completed questionnaires for the purpose of becoming familiar with all the details, after which they separated into groups of two for a thorough examination of the questionnaires about which there seemed to be some doubt as to the eligibility of the college for accreditation. When this task was completed, the members reassembled and reported on the questionnaires which they had examined. The points at issue were then discussed and it was agreed that inspection should be begun immediately and that as many as possible of the following colleges should be inspected before the end of the present school year:

- University of Florida, School of Pharmacy
- University of Illinois, College of Pharmacy
- Purdue University, School of Pharmacy
- State University of Iowa, College of Pharmacy
- University of Kansas, College of Pharmacy
- Loyola University, College of Pharmacy
- Xavier University, College of Pharmacy

University of Maryland, School of Pharmacy
 Massachusetts College of Pharmacy
 University of Michigan, College of Pharmacy
 Ferris Institute College of Pharmacy
 University of Minnesota College of Pharmacy
 University of Mississippi, School of Pharmacy
 St. Louis College of Pharmacy
 University of Nebraska, College of Pharmacy
 Creighton University, College of Pharmacy
 Rutgers University, New Jersey College of Pharmacy
 Fordham University, College of Pharmacy
 University of North Carolina, School of Pharmacy
 Western Reserve University, School of Pharmacy
 Duquesne University, School of Pharmacy
 University of Pittsburgh, Pittsburgh College of Pharmacy
 Medical College of Virginia, School of Pharmacy
 West Virginia University, College of Pharmacy.

It was decided to visit the following colleges in the far West after the colleges of this group, which have requested that inspection be deferred have made formal application:

University of California, College of Pharmacy
 University of Colorado, College of Pharmacy
 University of Montana, School of Pharmacy
 North Dakota Agricultural College, School of Pharmacy
 South Dakota State College, Division of Pharmacy
 University of Washington, College of Pharmacy
 State College of Washington, School of Pharmacy
 Oregon State Agricultural College, School of Pharmacy
 North Pacific College of Oregon, School of Pharmacy.

The Council decided that it would be necessary to obtain information in addition to that supplied on the questionnaire forms before it could reach a decision with regard to an inspection of the following colleges:

Alabama Polytechnic Institute, School of Chemistry and Pharmacy
 Connecticut College of Pharmacy
 Medical College of South Carolina
 Kansas City College of Pharmacy.

COLLEGES NOT HEARD FROM TO DATE

A number of the colleges have not been heard from since the questionnaire forms were sent out. The secretary was instructed to write to these institutions calling their attention to the fact that they had not been heard from and that they were being written to a second time to make sure that the questionnaires were sent to them and to check up on those which might have gone astray in the mails or have been mislaid.

D. Inspection Committees. All of the members of the Council present indicated that they would be available to do some inspection work. It was decided that each inspection committee should consist of two members, one representing the board of pharmacy and one the colleges of pharmacy, except in the cases of border-line colleges in

which it was expected that unusual difficulties would be encountered. It was decided that it might be advisable in such cases to enlarge the inspection committee to three or four members, one of whom might be an outside educator.

The Chairman and Secretary were directed to prepare the itineraries for the inspection trips.

The meeting was adjourned at 12:30 midnight.

A. G. DUMÉZ, *Secretary*.

AMERICAN COUNCIL ON PHARMACEUTICAL EDUCATION

Instructions for the Guidance of Inspection Committees

The members of the inspection committee, while advised to be polite and friendly toward the administrative officers and faculty of the college of pharmacy undergoing inspection, are directed to be businesslike in the performance of their duties. They should be methodical in their work and devote all of the time spent at a college to matters pertinent to the inspection.

The Council has adopted the policy that its inspection committees will limit their acceptance of hospitality from the institution being visited to luncheon on the days of the visit and then only on the condition that it will be convenient for the institution.

To expedite the work of inspection, it is recommended that the following schedule of procedure be followed:

1. Before the inspection of a college, each member of the committee should familiarize himself with the questionnaire forms and catalogue of the institution to be visited. If this is done, it will enable the committee to complete its work with thoroughness and dispatch.

2. Hold a meeting of the inspection committee on the evening prior to the visit of inspection for the purpose of examining the completed questionnaire forms, analyze the situation as presented by the information on these forms, note what additional information should be requested, and make such other preparations as may be necessary for the visit of inspection.

3. Plan to arrive at the college as soon after 9:00 a. m. as possible.

4. First go to the Dean's office and ascertain from him:

- (a) How many hours per day he is actually at the college.

- (b) The nature and extent of the outside work which he does, if any.

- (c) How many hours per week he gives to teaching.

- (d) How many hours per week he gives to administrative work.

- (e) What the attitude of the President and other administrative officers of the University is toward the college.

Consult with him regarding the:

- (a) Administrative organization of the institution.

- (b) Proper officers to approach for the different kinds of information desired, financial, admission records, scholastic records, etc.

- (c) Best time to visit the various departments.

- (d) Visit to the President's office.

- (e) Etc.

5. If possible, the President or his appointed representative should be visited immediately after the conference with the Dean or Director.

It is assumed that the Dean or Director and any other administrative officers the President desires may also be present.

Discuss with him:

- (a) General institutional policies.
- (b) Questions arising from the questionnaire forms, catalogue, etc.

Ascertain from him:

- (a) The attitude of the administration toward the College of Pharmacy.
- (b) The attitude toward its future growth and development.
- (c) What has been done or is projected toward making provision for its future growth and development.
- (d) How the amount budgeted compares on the basis of enrollment with that budgeted for other departments of the University.

Request him to verify:

- (a) The values reported for grounds and buildings in case the institution is an independent or affiliated college.
- (b) The amounts of the mortgages and other liens on the grounds and buildings, also the amount of other indebtedness exclusive of that incurred in current operation.
- (c) The total amount of income received annually from all sources other than student fees. Record the sources and amounts if they seem unusual.

Ascertain from him:

- (a) What prospects, if any, there are for obtaining additional income for improving instruction, for research.

6. The officer responsible for admissions and for the keeping of the students' records should be visited next. The committee should satisfy itself that:

- (a) The information demanded of an applicant for admission is sufficient to enable the admitting officer to determine his or her eligibility for admission.
- (b) The entrance requirements as stated in the catalogue meet the standards set by the Council and that they are strictly adhered to.
- (c) How do the entrance requirements of the college of pharmacy compare with those of other colleges of the University?
- (d) The system in use for recording the grades of students is adequate.
- (e) Students whose grades are unsatisfactory are eliminated after having been given a reasonable opportunity to prove themselves.

7. The members of the committee may then separate and proceed to visit the library and different departments in which instruction is given to pharmacy students. The departments giving arts and science work need not be given a critical inspection if the institution is recognized as satisfactory by a regional accrediting agency approved by the American Association of Universities. Notes should be made on the library with respect to the following:

- (a) Training of the librarian.
- (b) Hours per day spent in the library.
- (c) Hours per day the library is open.
- (d) The system followed in cataloguing the books.
- (e) Approximate number of text and reference books pertaining

to pharmacy, pharmaceutical chemistry, pharmacognosy, pharmacology, toxicology, therapeutics, materia medica, commercial pharmacy, pharmaceutical arithmetic, history of pharmacy, etc.

(f) Approximate number of text and reference books on the other subjects of the curriculum.

(g) Approximate number of bound journals on the subjects listed under (e).

(h) Under what conditions may students borrow books from the library?

(i) Adequacy of reading room facilities.

Make a memorandum on each department covering the following items:

(a) Impression of the staff member in charge of the department.

(b) Adequacy of the quarters, equipment, apparatus and stock to give the instruction scheduled by the department.

(c) Titles of text-books used.

(d) Laboratory direction sheets used and student note books.

(e) Examinations given.

(f) Research or other productivity of staff.

8. The committee will reassemble at the office of the Dean or President at the conclusion of the visits to the library and departments. If there are any additional questions which should be answered by these officers, ask them at this time.

9. It is expected that the committee will usually complete the work of inspection on the afternoon of the second day. The members will then meet at their hotel to discuss their findings and to formulate their report to the Council.

10. Report. The report should cover the items enumerated and follow the order suggested in the following outline:

Outline for Report of Inspection Committee

1. School.

2. Location.

3. Date of application.

4. Date visited.

5. Date of report.

6. Personnel of committee.

7. Brief summary of interview with the dean.

8. Brief summary of interview with the president.

9. Brief summary of conditions with regard to admissions and student records.

10. Brief summary of findings in the library and departments of instruction.

(a) Library.

(b) Pharmacy.

(c) Pharmaceutical chemistry.

(d) Botany and pharmacognosy.

(e) Etc.

11. Statement on financial status.

12. Statement with regard to the adequacy of buildings and equipment.

13. Statement on adequacy of the faculty from the standpoint of numbers, qualifications, etc.

14. General impression of institution as a whole.

15. Recommendations, with concise statements of reasons therefore.
 - (a) To accredit immediately.
 - (b) To accredit until 1944 if income requirement is not met at of inspection.
 - (c) To withhold accreditation until deficiencies are made up.
 - (d) To deny accreditation for the present.
 - (e) Other recommendations.

The Sixth Educational Conference

ERNEST LITTLE

Rutgers University College of Pharmacy

It was a real privilege to represent the American Association of Colleges of Pharmacy at the Sixth Educational Conference which was held under the joint auspices of the Committee on Measurement and Guidance of the American Council on Education, the Commission on the Relation of School and College of the Progressive Education Association, the Cooperative Test Service, and the Educational Records Bureau which was held at the Roosevelt Hotel on October 28 and 29. The conference was held in conjunction with the Seventh General Meeting of Institutional Members of the Educational Records Bureau.

The meetings were well attended on both days of the sessions and called forth unusually free discussion on the part of delegates in attendance. Among the many acquaintances whom I met at this conference was our good friend Dean Edward H. Kraus of the University of Michigan. Dean Kraus still displayed a keen interest in pharmaceutical education. He inquired as to how things were progressing in the American Association of Colleges of Pharmacy and asked about his many friends with whom he was formerly more closely associated.

My experiences at this conference confirmed my conviction as to the wisdom of sending representatives to meetings of this type whenever practicable. Many of the delegates with whom I talked, seemed somewhat surprised but also much pleased that pharmaceutical educators should be interested in conferences of this sort. I refused to take cognizance of their surprise at our presence but inwardly approved of the satisfaction they seemed to display.

It would be quite impossible to report on the many fine papers which were read at these meetings. Possibly one or two might be briefly commented upon.

Dr. Wilford M. Aikin, Professor of Education at Ohio State University and Chairman of the Commission on the Relation of Schools and Colleges, gave a very interesting report for his committee. His report was entitled: "Preparing Students for College."

Professor Aikin's report was planned to be based upon material furnished by the heads of thirty preparatory schools who were supposed to be studying this very important problem. Professor Aikin expressed regret that many of the preparatory school heads seemed only passingly interested in the educational problem involved. He referred to them as being too much interested in helping students obtain information and develop technical skills to make the observations essential to the study of this highly important problem.

Professor Aikin stated that in his opinion many colleges had altogether too narrow a conception of the purpose of education. He expressed the opinion that the purpose of education should be regarded as broadly as: "To provide rich and meaningful experiences in the basic experience of living."

He recommended that colleges place greater stress on contemporary civilization and to provide their students with a greater opportunity for self expression.

Dr. Aikin urged that our basis of thinking in our approach to educational problems should be the needs of youth in a democratic society even though our thoughts are at the present time somewhat confused as to the significance of democracy.

President A. P. Henderson of Antioch College, presented a paper entitled: "Individualization in the Antioch Program."

Dr. Henderson stated that it is the responsibility of the college to develop personal as well as educational qualities through promoting recognition and development of all those qualities which go to make up a balanced personality.

President Henderson presented in considerable detail the entrance requirements which are in effect at Antioch College. He threw on the screen sample application blanks filled out by students showing the extensive data required of each student for consideration in conjunction with personal interviews. He stated further that they tried at all times at Antioch to keep before them as a guide to entrance problems: "Can the applicant probably carry the Antioch program successfully with profit to himself?"

He stoutly defended the system of alternating study in the university with work in the professional field as is now carried out at Antioch, the University of Cincinnati and some other colleges. He stated that classroom and college laboratory work alone tended to develop immature amateurs whereas practical work in industry, even when alternated with college work, develops mature persons of responsibility.

Dr. B. R. Buckingham of Ginn and Company presented one of the boldest and therefore one of the most interesting papers of the two day sessions under the title of: "Disciplinary Values in Individualized Education."

Dr. Buckingham stated that there is in fact, no such thing as mass education. He allowed of the term simultaneous education but stated that there must of necessity be a personal contact and relationship between the teacher and student at all times, if worth while education is to result. He stated that the best test of a good teacher is the extent to which he reaches each individual while talking to a group.

Dr. Buckingham allowed of no such possibility as a misfit child. He stated that our educational system and educational methods should be flexible enough to prove of value to every child with which it comes in contact. From this viewpoint we can allow of misfit textbooks, misfit teachers, misfit educational systems, but no misfit children. It is they which the systems should be constructed to serve.

Dr. Buckingham decried the over-appreciation and over-emphasis which is placed upon so-called high educational standards, without some method whereby these standards can justify their own existence by some definite contribution to the general good.

He stated that he would be bold enough to define promotion as: "The transfer of a pupil to a new environment which for the moment seems more appropriate." It is the welfare of the pupil and that alone which should be kept paramount when building up any educational system.

At the luncheon on October 28 the speaker was Dean Max McConn of Lehigh University, who spoke on the subject: "Putting the Tests to Work." At dinner in the evening of the same day, President James B. Conant of Harvard University, related some interesting facts relative to the functioning of the Educational Records Bureau and pointed out the increasingly important part which it is playing in modern education.

Dr. Conant recommended the co-ordination of high school and college examining agencies to bring about a common program of research and study in the field of predictive tests. He stated that nothing more than a start has been made in the field of testing. Dr. Conant feels that the rigid system now used in professional schools which prepares one type of mind for a particular kind of work, has failed to supplement its training with other fundamentals of learning which may be needed in later life. He considered it highly regrettable to send a brilliant type of boy into a learned profession and not equip him with certain rudiments of learning which would later give him the opportunity to make investigations which he could not very well make without such equipment. Many such men will, for example, end up in positions where their lack of training in mathematics prevents further desired scientific advancement.

Dr. Conant stated that new developments in the conception of testing and placements should go a long way toward breaking down "composite academic ability" of students, and afford, through predictive tests, guides for all sorts of vocations and avocations for which an ability on the part of the individual is clearly shown.

Standardized testing should, in his judgment, prove a particularly effective means of aiding the weaker college students. By discovering the inherent weaknesses of the student who is not in the front rank, except in one particular field, the intellectual stature of that particular student could be greatly improved.

The sessions were attended by serious, capable workers in the field of education and proved helpful and inspirational to all who attended.

Report of the Committee On Endowment of the National Drug Trade Conference

For several years the committee on Endowment has presented a report before this group which has been well received by the delegates in attendance but which has not resulted in the adoption of a definite program which might hold forth promise of productive results.

The chairman of this committee was thrilled and greatly pleased at last December's meeting when our chairman, Mr. Fraley, expressed the wish that this conference might adopt such policies and, if possible,

a definite program which would make possible the effective operation of the committee on Endowment.

If any of you wonder, as I then did, why such a program has not already been drawn up and adopted by this body, I think your query may be rather *adequately* answered if you will but take time to determine the attitudes of individuals from whom financial assistance of this sort might reasonably be expected and then attempt to formulate a definite plan of procedure on a basis of such information.

I do not mean by this that men of wealth in our pharmacy group, either as individuals or as representatives of industry are not willing to give or recommend appropriations for the support of what they consider to be worthy activities, educational or otherwise. I very definitely believe that such financial help is, within reason, available.

My point is that many of these men feel that contributions of this sort cannot be obtained collectively, through the agency of an Endowment committee, as well or to such an extent as they can through individual contacts for specific purposes.

We have had a fine demonstration since our last meeting, by certain officers of the American Pharmaceutical Association as to the potential financial help which is forthcoming for worth while pharmaceutical activities. The success of these men was due, in the first place, to the fact that the cause which they represented was considered to be a worthy one; secondly, they understood how to present their case in such a way as to make an effective appeal, and, thirdly, they contacted men of vision possessed of both wealth and altruism.

We who are primarily, although not exclusively, interested in securing more adequate financial support for colleges of pharmacy, rejoice in their success. We hope that the spirit on the part of the donors which made such splendid contributions possible, will prove to be both chronic and contagious.

Dr. William G. Crockett, in his presidential address before the American Association of Colleges of Pharmacy in New York City last August, made the following statement and recommendation:

"The subject of finances is one which vitally concerns all colleges of this Association. Some member schools are handicapped in giving a vigorous four year course. Others are unable to conduct research to which they are particularly adapted. It is my belief that thriving members of the drug trade would gladly support both education and research in schools of pharmacy if they but knew the needs and facilities of the institution concerned. The establishment of grants, scholarships and fellowships by pharmaceutical interests in non-pharmaceutical institutions is well known and commendable. A pharmaceutical manufacturer who subsidizes research wishes results. Pride in his pharmaceutical attainments and the fostering of good will, undoubtedly prompt him to favor pharmaceutical institutions. He has nothing to guide him, however, in selecting the one best suited to his needs. Under such conditions, exception should not be taken to his patronizing a well established laboratory of non-pharmaceutical nature."

"Although many schools are hard pressed in giving creditable undergraduate instruction, few contemplate ambitious programs of research. Such being the case, liberal support of pharmaceutical education by philanthropists is more to be desired than generous support of research. Successful pharmaceutical interests could make a noble con-

tribution by including in their annual budgets the item 'grants-in-aid to pharmaceutical institutions'. Utilization of such funds for the improvement of undergraduate instruction would slowly but surely enable needy institutions to function in a most creditable manner. Knowledge of the service rendered should bring continuous and immeasurable satisfaction to the donors."

"It would be a simple matter for institutions to submit to the Executive Committee of this Association, or to a specially appointed committee, a statement of certain of their specific needs. Such requests for support could then be made available to interested members of the drug trade. It is understood, of course, that each project be outlined fully—that it show the extent of the need, the benefits to be derived and an itemized statement of the cost."

"It is practicable to ascertain, by questionnaire or otherwise, the types of research for which the different departments of our colleges are best suited and the extent to which they could carry on if adequately financed. This information could be published in the *American Journal of Pharmaceutical Education* and reprints sent to the pharmaceutical industries."

"I recommend that the Problems and Plans Committee be authorized to assemble the undergraduate needs and evaluate the research facilities of the colleges of this Association, and in addition, act as a liaison to pharmaceutical business interests for the promotion of a better understanding and for procuring educational and research support for our colleges of pharmacy. This recommendation purposes furthermore that the committee cooperate, when advisable, with committees of affiliated pharmaceutical organizations which are seeking the same objectives."

You notice that Dr. Crockett's recommendation very properly makes it possible for the American Association of Colleges of Pharmacy to cooperate with the Drug Trade Conference or any other group who feel that they would like to cooperate in such a really important project and activity.

Your committee has devoted a great deal of thought to the proper functioning of this committee and has discussed it with a considerable number of other individuals.

We felt that the recommendation and adoption of a program which might prove disappointing or even distasteful to prospective donors, would be definitely worse than no formal program at all. A considerable number of men with whom we talked, felt very strongly that it would be better to have the Committee on Endowment function in the future somewhat as it has in the past; that is, to continuously stimulate general interest and if possible enthusiasm for contributions to education and other pharmaceutical activities, but to leave the details as to how this can best be done to the individuals involved.

The owner of a relatively small manufacturing concern, after expressing doubt as to the effectiveness of any centrally operating agency for the purpose we have been considering stated, "It is conceivable that some colleges might not care to accept contributions from me or from the firm which I largely own, definitely there are some colleges to which I would not care to contribute".

We see, therefore, that the best solution of the problems involved requires more than the collection of adequate data, logical conclusions

and sane recommendations based upon such conclusions. Sentimental, emotional and prejudicial forces are also at work and must be given consideration.

This committee feels that some sort of an organization can be constructed which will enable this committee to operate more dynamically than merely to exert stimulative or inspirational influences. We feel that definite and continuous progress should be made toward this end, but that there should be no hurried conclusion as to how this can best be done.

Should this committee or some related group assume the responsibility of writing to the various colleges requesting that they outline any special or pressing needs which they might care to reveal, with the thought of circularizing such information to possible sources of help or perhaps publishing them in the pharmaceutical press? Certainly this ought not to be attempted by this committee, as a committee of the Drug Trade conference, without being definitely instructed to do so.

Should we offer to operate in conjunction with a committee of American Association of Colleges of Pharmacy in line with President Crockett's suggestion? If so, would it be preferable to have the committee representing this group made up largely or possibly exclusively of non-college men?

It is possible that this committee can operate most effectively in attempting to promote programs of research in our colleges of pharmacy. Several people consulted have expressed this opinion. It might be possible to obtain from manufacturers a list of problems they would like to have investigated and which they would be willing to support by research fellowships. The committee might then attempt to determine which college or colleges, who have adequate facilities to carry on such a program of research, would care to do so.

I do not know, Mr. President, how much time you feel can properly be devoted to a discussion of this report. It would be very helpful if the members present could have the opportunity of expressing their opinions as to how they feel this committee can best operate. After further deliberation, the committee could then formulate a program for your adoption, rejection or modification at the December 1938 meeting.

ERNEST LITTLE, *Chairman.*

Abstract of Papers Given at Indianapolis at the December 1937 Meeting of the Subsection on Pharmacy (N₂) of the American Association for the Advancement of Science

1. *The Assay of Midriatic Drugs.* Alice Hyden, C. B. Jordan and H. G. DeKay. The authors determined the quantity of volatile constituents in hyoscyamus, belladonna and stramonium. These constituents

were tested pharmacologically and certain assay processes checked and modifications of the official assay processes for midriatic drugs and preparations were recommended to the Revision Committee of the United States Pharmacopoeia.

2. *Homologs of Salol. The Salicylates of Isomeric Amyl Phenols and Amyl Cresols.* H. G. Kolloff, J. O. Page and M. C. Hart. Since the establishment of the salol principle by Nencki, several esters of salicylic acid have been prepared in the hope that they would display a more powerful internal antiseptic action than the phenol salicylates. The discovery that the alkyl substituted phenols and cresols are more germicidal than the unsubstituted ones raises the question of whether or not salicylates of these might be more efficient internal antiseptics than salol. The salicylates of the following phenols were prepared by refluxing the desired phenol and salicylic acid in toluene with phosphorus oxychloride: *c*-*n*-amyl phenol, *p*-*n*-amyl phenol, 3-*n*-amyl-*o*-cresol, 5-*n*-amyl-*p*-cresol, 4-*n*-amyl-*m*-cresol, 3-*n*-amyl-*p*-cresol, *sec*-amyl-*p*-cresol, and 4-chlor-*o*-cyclo-hexylphenol. The rate of hydrolysis of these esters was found to compare favorably with that of salol.

3. *The Chemical Constitution and the Physiological Activity of the Latex of Ficus pumila L.* *Ficus pumila* L., also known as creeping fig, has not been previously investigated phytochemically. The author gave an account of the investigation now under way, on the chemical constitution of this latex. A protein fraction obtained from the latex exhibits the property of digesting some human and animal parasitic worms.

4. *A Study of the Toxic Principles of Red Squill.* Floyd J. LeBlanc and C. O. Lee. Red squill powder is very toxic to rats but not so toxic to other forms of animal life. The active toxic principle has not been definitely isolated, but an alcohol-ether solution was obtained which when evaporated gave no definite melting point but was found to be approximately one hundred times more toxic than the original red squill powder. White female rats are killed by one half the dose necessary to kill white male rats.

5. *Gelsemicine, Aconitine, or Pseudoaconitine: Which is the Most Toxic Alkaloid?* K. K. Chen, Robert C. Anderson, and E. Brown Robbins. The toxicity of gelsemicine, aconitine, and pseudoaconitine (in form of their halides) was compared, weight for weight, in mice, rats, guinea pigs and rabbits. The alkaloids were injected intravenously in mice, rats and rabbits, but subcutaneously in guinea pigs. The order of toxicity of the three substances varies from one species to another. The results show that in mice, gelsemicine > aconitine > pseudoaconitine; in rats, gelsemicine > pseudoaconitine > aconitine; in rabbits, pseudoaconitine > aconitine > gelsemicine; and in guinea pigs, pseudoaconitine > aconitine > gelsemicine.

6. *Daphnia—Indicator and Dosimeter in Microphysiology.* Arno Viehoveer. Experimental work with daphnia shows that it can be used as an indicator on organs representing the muscular, nervous, and glandular tissues in the case of many hypnotic irritant and laxative drugs as well as snake venoms and insecticidal substances.

7. *Mechanism of Action of Alpha Naphthyl Isothiocyanate.*—A New Organic Insecticide. A. Viehoveer and N. Tischler. A 1 per cent solution of alpha naphthyl isothiocyanate in combination with 0.03 per cent of pyrethrins in kerosene gives excellent control of house flies;

a 2 per cent solution of the chemical alone in kerosene when used at the rate of 1 pint to 1 quart on 100 square feet of the usual upholstery, woolen fabrics will give good control of clothes moth larvae and a triple amount of this mixture will give good control of carpet beetle larvae. The speed action where it is essential for practical purposes can be greatly hastened by the addition of small amounts of pyrethrum extract.

8. *Enteric Coatings*. J. T. Goorley and C. O. Lee. The studies showed that the commonly used enteric coatings are unreliable. A coating mixture was devised which depended upon the action of the digestive system for disintegration. A new formula was given with the procedure of applying it and the reliability of the coating was shown by numerous x-ray pictures and fluoroscopic experiments.

9. *Field Tests for Marihuana (Cannabis)*. Arno Viehoveer. Tests were designed for the immediate analysis of cigarettes or leaves in case of seizures which are supposed to contain marihuana. The most rapid extraction of the narcotic principle, cannabinal, without the excessive interference of plant pigments, can be made by replacing the contents of $\frac{1}{4}$ of a marihuana cigarette (1/300 ounce) in the reagent benzene (9 parts) and 2 per cent alcoholic potash (1 part) for 5 seconds. This reagent is rapidly poured off into a low-mouthed glass receptacle. From 1/3 to 1½ minutes the yellowish tint changes to pink and a deeper red, leaving after evaporation a purple residue. The residue redissolved in acetone yields a bluish-violet tint, while in strong ammonia an orange-red coloration appears. Using the benzene solution of marihuana (extracted for one minute) when evaporated and then tested on transparent *Daphnia magna*, the biological reagent, supplementary physiological evidence of unmistakable narcosis is obtained within one hour. Frost apparently does not destroy the activity of the agent.

10. *The Effect of Peptone on the Resistance of Staphylococcus aureus*. George F. Reddish and Ella M. Burlingame. Ten peptones were studied as to their effect on the resistance of *Staphylococcus aureus* to germicides. Then tested on the third, seventh, and tenth days after transfer to broth made with each peptone difference in resistance of these cultures were observed. Since tests on phenol dilutions were made at five, ten and fifteen minutes these variations were not so apparent as when the cultures were tested on an antiseptic solution at time intervals of thirty seconds one, two and three minutes. When these shorter time intervals were employed in the tests it was shown that nine of the ten peptones gave weaker cultures than did the broth made with Armour's peptone. These results showed that Armour's peptone in our hands was best suited for use in media employed for growing *Staphylococcus aureus* for use in testing antiseptics and disinfectants.

11. *Fluorescence Analysis of Some Alkaloids and Crude Drugs*. The substance or substances causing the characteristic fluorescence of alcoholic extracts of ipecac in ultraviolet light is alkaloidal in nature. The elimination of other alkaloids by using the proper precipitants seems to show that either psychotrine or O-methyl psychotrine, or both, are apparently found responsible for the fluorescence found in alcohol extracts of ipecac.

12. *The Determination of Volatile Oil in Vegetable Drugs*. Elmer H. Wirth. A study was made of the various methods for the determination of the amount of volatile oil in vegetable drugs. The efficiency of the various methods were determined and experimental evidence was

obtained illustrating the sources of error in the volatile ether extract method in the United States Pharmacopoeia. The study is of value in revising the methods used in pharmacopoeial revision.

13. *The Glycosides of Asclepias Cornuti or the Common Milkweed.* A. H. Rihn and H. G. DeKay. This plant has been studied for its caoutchouc content. Glycosides and saponins have been found in other species of *Asclepias*. The commonly accepted methods of extracting the drug were used and any glycosidal material was isolated from the extracts of the leaves, the stems, and the rhizomes. It was found that the sugars sucrose and glucose were present in the aqueous and alcoholic extracts of the several portions of the plant. The leaves and stems yielded a bitter principle which was divided into two fractions, one possessing toxic properties and the other non-toxic. There was apparently no glycoside in the leaves and stems. A glycoside was found to be present in the rhizomes which produced toxic principles when injected into sparrows.

Abstract of Papers Given at the Joint Session of the Subsection on Pharmacy with the Medical Science Section

1. *Inhibitions of the Autonomic Nervous System Which May Enter Through the Eyes.* E. L. Jones. The author discussed abnormal mechanisms in eyes as causative factors in the production of numerous symptoms in other parts of the autonomic nervous system. A large number of clinical cases was cited as evidence.

2. *Influence of an Anterior Pituitary-Like Principle on the Growth and Function of the Genitalia of the Male.* W. O. Thompson, N. J. Heckel, P. K. Thompson and L. F. N. Dickie. The anterior pituitary-like principle from the urine of pregnant women exerts a profound influence on the growth and function of the male genitalia. It is much more efficacious in the production of genital growth in man than any extract of the pituitary itself which is available at present. In young boys it may produce such marked stimulation of genital growth that premature puberty results. Boys developing premature puberty from the use of this material show a marked increase in the size of the penis, scrotum and prostate and the amount of pubic hair. In contrast to these changes the testes show little or no increase. Susceptibility to this growth stimulus is greater before than after the age of puberty, but is not completely absent after this period, a marked increase in the size of the genitalia having been produced with large doses as late as the age of thirty-seven years. The genitalia stop growing and may decrease in size when the administration of this material is discontinued. Because of its stimulation of genital growth, it is valuable in the treatment of hypogenitalism in the male, particularly in the boys of the Frölich type, and facilitates the operative correction of hypospadias.

3. *Leukaemia; Its Etiology, Nature, and Cure in Animals. Its*

Possible Relations to Certain Specific Diseases of the Human. N. W. Emmel. Leukemia has been induced in the chicken, dog, monkey, hog, sheep, goat and mouse by the repeated intravenous injection of small numbers of bacteria of the paratyphoid and typhoid groups. Such infection if carried to a certain point results in a chronic but progressive process of tissue autolysis without further stimuli by the casual organism. This fundamental process of self perpetuating autolysis of blood tissue eventually leads to the development of leukemia in from two to nine months. This process of progressive tissue autolysis can be initiated not only by the viable causal organism but also by similar injections of heat-killed causal organisms, chemicals, such as benzene, phenol and xylol, and homologous tissues (dog tissue into the dog, monkey tissue into the monkey, etc.). The nature of the fundamental process of tissue autolysis is similar regardless of the agent initiating the process and the species involved. An homologous tissue antiserum will cure the major portion of cases of all types of leukemia in the chicken and lymphatic leukemia in animals. The process of progressive tissue autolysis offers a new avenue of approach to the study of cancer and possibly other diseases of man and animals.

4. *Chronic Rheumatism Brain Diseases as a Factor in the Causation of Dementia Praecox.* Walter L. Bruetsch. Eight per cent of dementia praecox patients who were examined at autopsy showed signs of a chronic rheumatism infection, affecting the brain as well as the heart. In a small number of cases it was known that the infection had damaged the heart. The rheumatic affliction of the brain, however, which caused the mental breakdown was not recognized while living. The suggestion is made to separate the cases of dementia praecox caused by rheumatic brain disease from the large descriptive group of schizophrenia as a subgroup with a distinct etiology.

5. *Investigation on Certain Basic Mechanisms Necessary for Complement Activity.* E. E. Ecker. The study showed a close parallelism between ascorbic acid content and the activity of fresh guinea pig complements. Serums of scorbutic guinea pigs showed low complementary activities. The parallelism held true up to 1 mg. of ascorbic acid per 100 cc. of serum at which point no further increase of ascorbic acid in the blood serum of guinea pigs and in the case of subacute scurvy a rise of complementary activity was found. The effect of ascorbic acid on various fractions of complement was investigated and finally the effects of oxidizing agents like iodine, quinone, H_2O_2 , O_3 , Cu_2O , C_6H_5HgCl , and von Szent Györgi's hexoxidase. Under controlled oxidation studies we were able to reactivate the weakened complement by means of several reducing agents like ascorbic acid, H_2S , $Na_2S_2O_4$, and KCN. Aged complement was markedly reactivated with H_2S water. A study just completed introduces the relation of glutathione content of whole blood and complementary activity of the serum. It is possible to markedly reduce the glutathione content of the whole blood of guinea pigs and rabbits but the fall of complementary activity was not marked as in the case of scorbutic animals. In the animals with reduced blood glutathione contents the ascorbic acid was maintained at a normal or higher than normal level.

6. *Desiccated Thyroid Feeding and Androgenic Function of Ovaries.* R. T. Hill. Male mice were castrated and at the same time received

grafts of mouse ovaries in their ears. Subsequently the animals were subjected to an environmental temperature of 20° C. for several weeks, after which time their sex accessories had returned to normal as a result of the androgenic function of the grafted gonads. A second period of treatment consisted of continued exposure of 20° C temperature plus the daily feeding of a non-toxic amount of desiccated thyroid tissue for 21 days. At the end of this period of thyroid feeding the gross appearance of the sex accessories was that of long castrated males. Normal control males, kept under identical temperature and feeding conditions did not show any loss in the androgenic function of the testes as exhibited by the seminal vesicles and prostates. In a castrated male carrying an androgenosecreting ovarian graft it is concluded that in some manner the feeding of thyroid enters into the local or general metabolism (or chemism) to block or inactivate continued androgenic function of the grafted gonad. Since no similar response was obtained in the normal males, it is suggested that the androgen (a) secreted by a grafted ovary is of a different chemical nature than that of the testis.

7. *The Problem of Evaluating the Clinical Activity of Ergot Preparations.* Marvin R. Thompson. The assay methods officially enforced in the United States, Canada, Great Britain and other countries, measure chiefly the ergotoxine group of ergot alkaloids which are responsible for but a small part of the oral clinical activity, while completely neglecting the ergotretine activity which is responsible for the greater part of the clinical activity of Pharmacopoeial Ergot preparations.

8. *The Local Anesthetic Action of Thiazoles, Oxazoles, and Imidazoles.* Charles L. Rose. Four groups of new synthetic local anesthetics have been investigated in animals and in man. They are chemically derivatives of benzothiazole, dihydrothiazole, dihydro-oxazole, and imidazole. A most interesting finding is the fact that a member of the series has a very low toxicity by intravenous injections (approximately 40 per cent lower than that of procaine) but a higher toxicity of subcutaneous injection (approximately 100 per cent more than that of procaine).

9. *The Hemolytic Action of Sodium and Potassium Soaps.* Leroy D. Edwards. There are no chemical tests that will satisfactorily distinguish true olive oil soap from soap made from other oils. A study of the mechanism of the hemolytic action of sodium and potassium soaps was undertaken as a possible means of determining the nature of the soap. Chemically pure soaps were prepared from each of the following acids: lauric, myristic, palmitic, stearic, oleic, and ricinoleic. The hemolytic power of these soaps was then determined at various H-ion concentrations over a pH range of 6 to 9. The effects of the addition to a soap solution of alkali, mineral acid, and free fatty acid were also investigated. The results obtained in the pH study indicates that the typical hemolytic curve of a soap shows in the extreme acid range only moderate hemolytic power. As the H-ion concentration is reduced, the lytic value is lowered. The maximum values of the different soaps occur at widely differing pH ranges. These results also demonstrated that the determination, at 37° C of the complete lytic curve for most soaps is impossible since the rise and fall of the curve do not come within the pH limits of stability of the human red cell. The rises and succeeding falls in the hemolytic curves of the more soluble soaps appear at a higher H-ion concentration than those of the more insoluble

soaps. When the soaps of the saturated fatty acids are compared as to their greatest lytic values at a given temperature, the following order is found: laurates>myristates>palmitates>stearates. This order does not hold at a given pH. At a given pH, an increase in the temperature enhances the hemolytic action of soaps. The following factors as possible causes for the observed augmentation and diminution of the hemolytic value of a soap at various pH ranges are suggested: (1) the lowering of surface tension by soap; (2) the free alkali of soap solutions; (3) undissociated soap; (4) free fatty acid; (5) fatty acid ion; (6) acid soap. The conclusion is made that the ultimate lytic component of common soap solution is the fatty acid molecule, and that it is enabled to act as such through the mechanism of some intermediate product of hydrolysis such as the acid soap or through a peptizing effect of undissociated soap.

10. *Mechanism of Action of Aphrodisiac and Other Irritant Drugs.* Arno Viehoever and Isadore Cohen. There is need for the selection and evaluation of an efficient but safe aphrodisiac. Therefore a study of certain aphrodisiac drugs was undertaken. In the initial studies, *Daphnia magna*, the transparent crustacean, was selected as a test animal since it had previously shown its merit as a biological reagent in the specific action and associated effects of drugs, especially narcotics, laxative substances, and potent poisons. Both the specific action and the associated physiological effects of the following three substances were recorded: yohimbine (HCl salt), cantharidin and capsaicin. All three substances cause pronounced and continued excitatory movements of the male genital organs. Actual ejaculation of the sperm was observed with the use of cantharidin. In varying concentrations the order of increasing lethal toxicity was found to be yohimbine, capsaicin and cantharidin. These agents in high concentration also produce irregular clumping and stasis of the intestinal contents as a result of the progressive and prominent swellings in the lining of the intestinal canal. In low concentration, 0.0038-0.0025%, yohimbine causes evacuation in young daphnia (7-9 days old); while capsaicin and cantharidin, both 1:30,000, show as a rule no indication of valuable laxative properties, their local irritant action apparently prevailing. Yohimbine and capsaicin in varying concentration depress progressively both the heart, producing dilation, and the respiratory movements. Cantharidin in suspension stops first, all vital activity except that of the heart, which then shortly collapses. Gravid females exposed to 0.1-0.25% yohimbine for five hours can be recovered by returning them to culture media although there remains even after 24 hours a partial depression of the heartbeat. Normal life activity, including the release of several broods of young, was observed subsequently. Yohimbine and capsaicin in varying concentration produce an exaggerated torsion of the muscles controlling the movement of the eye. Part of these movements occurred after one hour in a suspension of capsaicin. The alteration in the normal swimming of animals under the influence of yohimbine (0.2-0.025%) and capsaicin (suspension) is caused by inco-ordination of antennal movements, and, possibly in part, by the derangement in the optical system. The derangement of the swimming mechanism and the internal balances correlated can obviously be used as criteria in establishing the toxicity of test substances. These results with *Daph-*

nia furnish additional evidence that there are no sharply demarcated physiological differences between invertebrates and the vertebrates. Certain specific and associated effects coincide with previous findings on vertebrates. The value of *Daphnia* as a biological reagent is further demonstrated by the unmistakable and consistent response of the anatomical and physiological systems to these additional test substances.

11. *Light Deficiency Rickets in Monkeys (Macaca rhesus)*. Henry J. Gerstenberger. On the basis of observations made on a total of 48 monkeys, protected against exposure to antirachitic wave lengths and receiving a diet high in phosphorus as compared to calcium, it is concluded that the rickets produced is quite like that met with in full-term human infants, inasmuch as 47 developed in the blood a low phosphorus level and only one a low calcium level.

12. *New Pharmacological and Bacteriological Facts about Iodocholeates*. Paul C. Goedrich. It has been found that the germicidal experiments properties of iodocholeates are superior to those of tincture of iodine combited under severe and generally unfavorable conditions. Both aqueous and alcoholic solutions of iodine combine rather rapidly with blood serum, the iodine thus combined possessing no germicidal properties. Iodocholeates in solution combine with blood serum to a very much smaller extent, and for this reason its germicidal action is not reduced as appreciably as aqueous or alcoholic solutions of iodine, when used under conditions where blood serum and tissue fluids are present as is so frequently the case in general use. The free iodine in a tincture or Lugol Solution is rapidly converted into iodocholeates when bile acids or their salts are added. This reaction is followed by a marked increase in germicidal action. The reaction which occurs in the formation of iodocholeates nor is it a necessary part of this material. Iodocholeates are but very slightly volatile at body temperature. A 2 per cent solution of iodocholeates will retain many times as much iodine as a 7 per cent U.S.P. tincture after exposure of 10 to 15 minutes at such temperatures. An alcoholic solution of iodocholeates when boiled shows no separation and almost no volatilization of iodine. Further tests again indicate the exceedingly low toxicity of iodocholeates. The fact that iodocholeates retain their iodine in active form under conditions such as exist in the treatment of wounds is of clinical significance. Its low volatility prevents the loss of iodine such as has been found to occur in the case of the U.S.P. tincture. Because of the fact that it is non-irritating, it can also be used under bandages without causing blistering or other bad effects.

13. *A Study on the Temperature Necessary to Cause Death in Fatigued Neurons as Compared with Resting Neurons*. George D. Shafer and Royce K. Shaw. It has recently been shown that the heat rigor temperature of fatigued muscle is considerably lower than that of resting muscle, the lowered rigor temperature of fatigued muscle cells being associated with their uptake of water through an increased osmotic pressure which they acquire during the fatiguing process. It is now shown that when fatigued and resting neurons and nerve fibers (mates) are heated at once, the heated units lose irritability at a slightly lower average temperature and are killed at a very slightly lower average temperature than their resting mates, the death temperature being a little higher in every case than the temperature at which irritability is

lost. When fatigued and resting neurons or nerve fibers have been heated until all irritability has been lost, but not to the killing temperature, they recover on cooling, but sensory resting units recover an action potential averaging 4.3 times greater than that of their fatigued mates; the resting motor fibers 3.0 times higher than their fatigued mates. The average differences in temperature at which irritability is lost and at which death results in fatigued and resting nerve units, though small, are shown to be significant by Fisher's method of analysis of variance. It is suggested, by analogy with results on muscle, that the above temperature differences with respect to fatigued and resting neurons may be associated with uptake of a slight amount of water by the fatigued units.

The program committee of the Subsection on Pharmacy wishes to express through their chairman their appreciation of the manner in which Mr. F. E. Bibbins of the Lilly Laboratories conducted the programs of the Subsection program and the joint session program at the Indianapolis meeting.

RUFUS A. LYMAN, *Chairman.*

*Announcement by the U.S.P. Anti-Anemia Products Advisory Board
Concerning Liver Preparations Conforming to U.S.P. Standards*

When liver and stomach preparations were admitted to the U. S. Pharmacopoeia, Eleventh Edition, it was recognized that these products present a different problem, from the viewpoint of standardization, than any question previously before the Pharmacopoeia.

As no ordinary methods for standardization or testing were available, an Advisory Board, made up of specialists in the treatment of anemia, was appointed. This Board established methods for determining the value of anti-anemia products, and the basis for a U.S.P. "unit of potency". They also issued forms for reporting evidence of clinical value and announced regulations for indicating the potency of U.S.P. products and for the wording of the labels.

On the invitation of the Board, a large number of clinical reports were submitted by manufacturers in evidence of the value of their products and the Anti-Anemia Board, after reviewing these records, herewith submit their conclusions. This first report lists the products which have been approved up to this time as complying with the U.S.P. specifications and the firms authorized to sell or distribute them.

As is probably generally known, only a relatively small group of manufacturers have provided the necessary hospital facilities for checking the clinical value of anti-anemia products as required by the Board, and several of these distribute their products through the medium of other pharmaceutical firms.

Having been supplied with adequate clinical evidence of the efficiency of a manufacturer's product and having accepted it as of U.S.P. grade with a specific dose, the Anti-Anemia Board, on request, have also authorized the distribution of some of these approved products by other firms when the firms have given assurance that their handling of the products will in no way alter its quality or

potency. No doubt the Board will later report additional approved preparations and firms.

E. FULLERTON COOK.

(The report of the Board and a list of the approved preparations and firms may be obtained by addressing Dr. E. F. Cook, Philadelphia.—The Editor.)

PHARMACEUTICAL APPOINTMENTS IN THE MEDICAL ADMINISTRATIVE CORPS OF THE ARMY

- 1—Leonard Paul Zagelow, Odessa, Wash., a graduate of the School of Pharmacy State College of Washington, will be stationed at Fitzsimmons Hospital, Denver, Colo.
- 2—George Henry Wilson, Pittsburgh, Pa., a graduate of the College of Pharmacy University of Pittsburgh, will be stationed at Carlisle Barracks, near Harrisburg, Pa.
- 3—James Wheeler McCormley, Wilson, Pa., a graduate of the School of Pharmacy Duquesne University, will be stationed at Carlisle Barracks, near Harrisburg, Pa.
- 4—Ernest William Bye, Topeka, Kans., a graduate of the School of Pharmacy University of Kansas, will be stationed at Fort Leavenworth, Kansas.
- 5—John Valdo Painter, a graduate of the College of Pharmacy, University of Minnesota, will be stationed at Fort Snelling, St. Paul, Minn.

E. F. KELLY,

Secretary American Pharmaceutical Association.

The Pharmaceutical Syllabus and Its Revision

In this report the chairman wishes to submit the personnel of some of the subcommittees that have been appointed to date. The tasks of these subcommittees are to prepare and submit outlines with definite recommendations to the Syllabus Committee for its consideration and action. To arrive at definite decisions on these proposed outlines a meeting is being planned, to be held in August, 1938.

Much time and thought has been devoted by the general chairman and the subcommittee chairmen to the selection of these committees and it is hoped their selections, in general, will meet with the approval of those interested in the advancement of pharmaceutical education and in the Syllabus. In some cases the memberships of the committees will be changed by deletions and appropriate additions. It is hoped that a final list will be presented at an early date.

ACCOUNTING

P. C. Olsen, Philadelphia, Chairman.
C. Leonard O'Connell, Pittsburgh
H. Olive Cole, Maryland
E. Fullerton Cook, Philadelphia
C. W. H. Scholz, Wharton School of Finance
H. W. Heine, Purdue

BIOCHEMISTRY

H. B. Lewis, Michigan, Chairman
Carl E. Schmidt, California
C. J. Klemme, Purdue
F. C. Forbes, Virginia

BOTANY

H. W. Younken, Massachusetts,
Chairman
H. R. Totten, North Carolina

F. J. Bacon, Western Reserve
C. W. Ballard, Columbia
L. K. Riggs, Washington
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BACTERIOLOGY

Louis Getshenfeld, Philadelphia,
Chairman
Malcolm Soule, Michigan
T. C. Grubb, Maryland
Ralph Pressman, Philadelphia

BIOLOGICAL SCIENCES

R. A. Deno, Virginia, Chairman
R. A. Lyman, Nebraska
Rolland Main, Virginia
A. J. Carlson, Chicago
Peter Okkelberg, Michigan
A. F. Shull, Michigan
Henry B. Ward, Illinois

CALCULATIONS OF PHARMACY

E. L. Hammond, Mississippi,
Chairman
J. W. Sturmer, Philadelphia
Edward Spease, Western Reserve
C. H. Stocking, Michigan

DISPENSING PHARMACY

L. W. Rising, Washington, Chair-
man
To be selected.

HOSPITAL DISPENSING

Edward Spease, Western Reserve,
Chairman
W. G. Crockett, Virginia
H. A. K. Whitney, Michigan
I. T. Reamer, Duke

LATIN OF PHARMACY

Hugh C. Muldoon, Duquesne,
Chairman
J. G. Beard, North Carolina
J. L. Hayman, West Virginia
Leon Thompson, Massachusetts
W. F. Gidley, Texas

ORGANIC PHARMACEUTICAL CHEMISTRY

F. F. Blicke, Michigan, Chairman
Marston T. Bogert, Columbia
W. H. Hartung, Maryland
C. T. Daniels, California
F. A. Gilfillan, Oregon
G. W. Webster, Illinois

PHARMACOLOGY AND BIOASSAY

James M. Dille, Washington,
Chairman
H. G. O. Holck, Nebraska
H. B. Haag, Virginia
P. J. Henzlik, Stanford
R. N. Bieter, Minnesota

CULTURAL SUBJECTS

J. L. Powers, Michigan, Chairman
To be selected.

HISTORY AND LITERATURE OF PHARMACY

E. J. Ireland, Florida, Chairman
Edward Kremers, Wisconsin
William Richtmann, Wisconsin
C. O. Lee, Purdue
C. C. Albers, Texas
Lloyd E. Harris, Oklahoma

INSECTICIDES

L. E. Harris, Oklahoma, Chairman
J. J. Davis, Purdue
Z. P. Metcalf, North Carolina

MANUFACTURING PHARMACY

Edward D. Davy, Western Reserve,
Chairman
W. G. Crockett, Virginia
Marvin J. Andrews, Maryland
H. A. K. Whitney, Michigan

PHARMACEUTICAL JURISPRUDENCE

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Robert P. Fischelis, New Jersey

PHARMACOGNOSY

B. V. Christensen, Florida, Chair-
man
H. W. Younken, Massachusetts
E. H. Wirth, Illinois

PUBLIC HEALTH STUDIES
Leonard J. Piccoli, Fordham,
Chairman

R. A. Lyman, Nebraska
M. J. Rosenau, North Carolina
Haven Emerson, Columbia
B. E. Holsendorf, United States
Public Health Service
Albert Hardy, Columbia
Robert P. Fischelis, New Jersey
E. B. Phelps, Columbia
Carl F. Meyers, California

QUANTITATIVE PHARMACEUTICAL CHEMISTRY

G. L. Jenkins, Minnesota, Chairman

M. L. Jacobs, North Carolina

G. E. Cwalina, Creighton

STATE BOARD QUESTIONS

Robert P. Fischelis, New Jersey, Chairman

H. A. K. Whitney, Michigan

R. B. Cook, West Virginia

State Board Members of the Syllabus Committee.

HENRY M. BURLAGE, *Chairman.*

New Books

PHARMACEUTICAL MATHEMATICS, by Edward Spease, B.S., Ph.M.
Second Edition, 1938. McGraw-Hill Book Company, Inc., 150 pages.
Price, \$1.75.

The general plan of the first edition of this work, intended by the author as a textbook in teaching the mathematics of pharmacy to pharmacy and nursing students, has been followed but the book has been improved and enlarged considerably. Two chapters have been entirely rewritten and additional illustrations by the use of examples have been added. A total of 366 problems are included, which represents a net increase of 122 problems, as compared with the first edition. The chapter on percentage solutions has been rewritten to conform to the rulings of the U.S.P. XI governing the choice of methods "when the expression 'per cent' is used in prescriptions without qualification." The book consists of 25 chapters, dealing with 23 different types of calculations, which makes it appear to be adequate in scope to cover practically all kinds of calculations likely to be encountered by the pharmacist, and a few that will be of minor importance to the student of nursing. The explanations are clear and concise, and well illustrated by examples. In the addition of new problems, new material has been added to all but six chapters. In accordance with the policy adopted in the first edition, the answers to the problems have not been included. An excellent index is provided, which permits ready reference to specific types of problems or to metrological terms. The book has much to commend it to teachers and students of pharmaceutical arithmetic.

JOSEPH B. BURT.

LESSONS IN PHARMACEUTICAL LATIN AND PRESCRIPTION WRITING AND INTERPRETATION, by Hugh C. Muldoon, D.Sc., Dean, School of Pharmacy, Duquesne University. Third Edition, Revised. John Wiley & Sons, Inc., 1937, New York. 232 pages. Price, \$1.75.

In this, the third edition of the well known and popular work on Pharmaceutical Latin, certain features have been added which still further enhance its value. The principal changes noted are the inclusion of optional exercises at the end of each chapter, the new summaries of the second and third declension nouns, a list of definitions of pharmaceutical preparations, and new prescriptions for study and interpretation. In addition many of the exercises have been expanded or rewritten. The inclusion of optional exercises is especially valuable in that it permits the instructor to vary the assignments from year to year, or to exercise some choice in the material used. The text is provided with two excellent vocabularies which are quite com-

plete. The Latin-English vocabulary contains approximately 2,000 words, while the English-Latin vocabulary contains about half this number. Latin terms and phrases introduced in the text are repeated in the vocabulary, a feature which adds greatly to the usefulness of the book. Careful examination of the text would seem to indicate that the hope of the author "that it may prove of value to the student of medicine, and also find a use as a reference book in the hands of the practicing pharmacist and physician" is fully justified.

JOSEPH B. BURT.

APPLIED PHARMACOLOGY, by A. J. Clark, Professor of *Materia Medica* and Pharmacology in the University of Edinburgh, Sixth Edition, cloth; 678 pages; 83 illustrations. P. Blakiston's Son & Co., Inc., Philadelphia, 1938. Price, \$5.00.

The rapid strides of progress in pharmacology during the past decade is reflected in this new edition of Clark, in that an average of sixteen pages per year has been added with a corresponding increase in illustrations. In this text the topics are arranged according to systems of the body, and each chapter is preceded by a valuable summary of the physiology of the system in question, written by a man who himself is a physiologist of note. The major change in the present edition consists in a rearrangement of the material, gathering "in the first quarter of the volume, of all the substances which the body either manufactures itself or normally receives in its food," and this portion has been almost completely rewritten. However, throughout the book recent advances are included, such as alcoholism and motor accidents, evipal and other hypnotics in basal anesthesia, benzedrine, atabrine, mandelic acid, and sulfanilamide compounds. The author also has given a condensed discussion of general principles of drug action on which he is an authority; and there is again a discussion of the pharmacology of radiations. Although this book comes from the pen of the Professor of Pharmacology at Edinburgh, the U.S.P. XI names and doses in general are included; a few errors in these have crept in, notably in the doses of caffeine and caffeine citrate. This book is written in a lucid style and the author takes a definite stand in many problems. It is valuable either as a text or for collateral reading.

H. G. O. HOLCK.

THE 1937 YEARBOOK OF GENERAL THERAPEUTICS. Edited by Bernard Fantus, M.S., M.D. Professor of Therapeutics, University of Illinois, College of Medicine, and Samuel J. Nichamin, B.A., M.D. Associate Attending Physician, Cook County Hospital. The Yearbook Publishers, Chicago, Illinois. 496 pages, 58 illustrations. Price, \$2.50.

The editor has made a compact volume of all the outstanding therapeutic methods used today and has stressed the development of the recent discoveries in the field of pharmacology and medicine, both at home and abroad. If a pharmacist or doctor wish to know the latest ideas about sulfanilamide, new vitamins, hormones and hormonal therapy, protamine zinc insulin, anesthesia, general or local, they can turn to this book for information. Besides discussing these new therapeutic agents, Dr. Fantus reviews the treatments of 152 common disorders, and includes new procedures that may be used by the doctor in general practice. The editor does not forget the mental aspect in the treatment of disease and has included a short appraisal of psychotherapy in the treatment of hypertension. One should bear in mind, however, that this

book gives a brief account of all the outstanding discoveries of 1937 in the field of therapeutics. It is not a complete medical textbook, but should be helpful as a reference book and should be in every pharmaceutical and medical library.

EDNA W. SCHRICK.

A TEXTBOOK OF ORGANIC CHEMISTRY FOR STUDENTS OF THE MEDICAL SCIENCES, by Hugh C. Muldoon, D.Sc. Professor of Chemistry and Dean of the School of Pharmacy, Duquesne University. Second Edition. P. Blakiston's Son and Co., Inc., Philadelphia. 590 pages, 33 illustrations. Price, \$3.00.

The second edition of this work follows rather closely the general plan of arrangement of the first edition, but is considerably enriched by additional material, including a new chapter dealing with hormones, vitamins, sterols and related compounds. The book is planned as a textbook for the first course in organic chemistry, especially adapted to the needs of students of medicine, pharmacy, dentistry and nursing, and contains ample material for a full year's course of study. The official organic compounds of the Pharmacopoeia of the United States and the National Formulary are pointed out and frequently used as examples in the theoretical discussions, rather than the conventional examples of less importance from a medical point of view, so commonly employed for this purpose in most organic textbooks. The exercises appended to each chapter afford a valuable teaching aid. Generous use has been made of cross references to avoid unnecessary repetition. The text is brief and concise in style, yet the explanations are clear and easily followed. Lengthy discussions of methods of preparation are avoided, with only the more important being included, and these are introduced chiefly as a part of the theoretical considerations. The author has attempted to strike a balance between the theoretical and practical aspects of the field, and has succeeded in introducing a considerable amount of related information from the realms of pharmacology, therapeutics, toxicology and pharmacy, which greatly increases the value of the work for students of the medical sciences. A glossary of medical terms and a list of reference books and periodicals is included in the appendix. This textbook should be especially useful in those schools of pharmacy offering special courses in organic chemistry to their students, and deserves a place in the reference library of all others.

JOSEPH B. BURT.

THE CHEMISTRY OF PLANT CONSTITUENTS, by Ole Gisvold, Ph.D., Instructor of Pharmaceutical Chemistry, College of Pharmacy, University of Minnesota, and Charles H. Rogers, D.Sc., Dean and Professor of Pharmaceutical Chemistry, College of Pharmacy, University of Minnesota. Burgess Publishing Company, Minneapolis, 1938. 309 pages. Price, \$3.50.

Much credit is due the authors for this contribution to the literature of phytochemistry. It deals with the chemistry of carbohydrates, plant and insect waxes, phytosterols, proteins, alkaloids, glycosides, anthocyanins and anthoxanthins, carotinoids, tannins, terpenes and oxygenated terpenes, vitamins, enzymes, products of fermentation, etc. It affords an excellent approach to the study of the chemistry of plant constituents, in that it represents a critical survey of the literature of this field. A most noteworthy bibliography is included, which contains

approximately 750 separate references to original papers. The value of the work is further enhanced by the inclusion of 28 tables summarizing the chemical and physical properties and other data pertaining to the several classes of compounds. The authors have succeeded in summarizing and bringing up to date much of the widely scattered information in the somewhat diverse fields of phytochemistry. While the nature of the subject matter may react against the general adoption of the book as a text in undergraduate courses in phytochemistry, it should afford an excellent outline for graduate courses, and serve research workers as a very useful guide to the literature of this field.

JOSEPH B. BURT.

A TEXTBOOK OF PHARMACEUTICS, by Arthur Owen Bentley, Reader in Pharmaceutics and Head of the School of Pharmacy in the University College of Nottingham, with eminent general collaboration. Fourth Edition, 1937, William Wood and Company, Baltimore. 1001 pages, 255 illustrations. Price, \$5.00.

The fourth edition of this rather comprehensive work has been rendered necessary by the appearances of the Addendum to the British Pharmacopoeia (1936) and of the British Pharmaceutical Codex (1934), and has been revised to correspond with these standards and the more recent advances in pharmacy. In the arrangement of material, the subject matter has been subdivided into six sections, dealing with (1) Political History of Pharmacy in Great Britain (pp. 3-57); (2) General principles and Apparatus (pp. 60-430); (3) Dispensing (pp. 433-590); (4) Pharmaceutical Preparations (pp. 592-859); (5) Pharmaceutical Biology (pp. 863-952), and (6) The Biological Assay of Pharmaceutical Preparations (pp. 952-985). An appendix, listed in the table of contents as a Table of Doses and Solubilities was found, strangely enough, completely missing from the copy examined. The first four sections of the book would constitute a work which would compare favorably with the general pharmacy textbooks commonly used in this country. The section on General Principles and Apparatus is quite complete and adequately provided with illustrations of the apparatus used. In general, detailed discussions of the fundamental pharmaceutical processes are included in this section, and their applications to both small scale and industrial operations are given. The section on history is particularly valuable as a reference source for material upon British pharmaceutical history and the history of the British Pharmacopoeia and its precursors. The section on Pharmaceutical Biology is essentially a brief course in applied bacteriology, with special reference to pharmaceutical applications. Even a cursory examination of the text indicates that it is a valuable reference for both teachers and students of pharmacy, which should be in every departmental library.

JOSEPH B. BURT.

A TEXTBOOK OF APPLIED BIOCHEMISTRY FOR PHARMACISTS AND PHARMACEUTICAL STUDENTS, by Frank Wokes, B.Sc., Ph.C., F.I.C. Member of the Staff of the Pharmacological Laboratories, College of the Pharmaceutical Society of Great Britain, 1937, William Wood and Company, Baltimore, 522 pages, 79 illustrations, 30 tables. Price, \$5.00.

This text was written in an effort to meet the needs of pharmacy students for training in the field of biochemistry. According to the

author's statement in the preface, the original intention was to present a brief general outline, pointing out the special applications to pharmacy and other branches of public health work. But the newer developments in the field of vitamins, the increasing importance of biological methods of assay, the introduction of physiology into the pharmacy curriculum, and the greater interest in pharmaceutical bacteriology and methods of sterilization have all tended to emphasize the fact that a more detailed study of many of these special phases was necessary. In general, the material appears to be well selected and well written. The subject matter is treated almost entirely from the theoretical point of view, with almost no consideration of the details of laboratory methods. If any criticism were to be offered, it would perhaps be directed at the classification and arrangement, rather than the content. For example, the biochemistry of the kidneys (including urinalysis) is discussed as a part of the general chapter on Proteins and Other Nitrogenous Compounds while the biochemistry of blood is treated as a part of the general chapter on Enzymes and Respiration. Such criticism is very largely offset, however, by the fact that the book is provided with an excellent index, permitting the instant location of any topic. An excellent literature reference list is also included, which contains approximately 300 separate references.

JOSEPH B. BURT.

PHYSIOLOGY FOR PHARMACY STUDENTS.

By Harold H. Barber, Ph.D. F.I.C., Head of the Sub-Department of Physiology, University College of Nottingham. 1937. William Wood and Company. 477 pages. \$4.50.

The writing of the book was inspired by the introduction of courses in physiology in the pharmacy schools of English universities and by the recent introduction of the subject into the final examinations of the Pharmaceutical Society of Great Britain. The material is well planned, well written, and is comprehensive in its subject matter. The anatomic descriptions and histological content are especially to be commended, since they are too frequently left out of physiological texts of this level. The figures illustrating physiological processes are exceptionally clear. At the end of each chapter are practical laboratory exercises well chosen for the illustration of the text material. The brief summary of the pharmacology of typical substances is included. And the final chapter deals with preparation and standardization of reagents and staining solutions with which the druggist has daily contact in his profession. The book will be educative to teachers of physiology in American schools of pharmacy with reference to the English point of view. That point of view will enrich our teaching.

R. A. LYMAN.

PHARMACEUTICAL THERAPEUTICS.

By Eldin V. Lynn, Ph.D. Professor of Chemistry, Massachusetts College of Pharmacy. Second Edition, 1938. McGraw-Hill Book Company, Inc. 430 pages, \$4.00.

This book covers the needs of the student of pharmacy in the fields of therapeutics, pharmacology, toxicology, and posology as revealed by the Commonwealth study. The character and arrangement of the material in the first edition of this book is well known and its use in

the classroom for nine successive years indicates how well it has filled a need. The new edition conforms to our legal standards and all subjects treated have been brought up to date. The important new drugs have been added. The doses of the British Pharmacopoeia have been omitted. This book should not only be in the hands of every student of pharmacy, it should be in every drug store.

R. A. LYMAN.

A TEXT-BOOK OF PHARMACOGNOSY.

By George Edward Trease. B. Pharm., Ph.C., F.L.S. Lecturer on Pharmacognosy in the University College of Nottingham. Second Edition, 1936. 671 pages. William Wood and Company. \$6.00.

A second edition of this book appearing within two years of the first one testifies to its popularity in Great Britain. A few changes in the arrangement of the subject matter have been made. The arrangement of drugs under families has been satisfactory but since the morphological method is used in certain schools, Chapter IV has been inserted so the student can use the book with equal facility irrespective of the method of teaching used. Since a companion book on physiology for pharmacy students by Dr. H. H. Barker has been written the chapter on vitamins and hormones has been omitted from this edition. Dr. Barker wrote this chapter which is now included in his text and has rewritten the chapter on enzymes from the strictly pharmacological viewpoint. The volume includes all the drugs in the United States Pharmacopoeia XI and we notice with satisfaction that Dr. Ralph Bienfang of the University of Oklahoma is one of the contributors. The reviewer of this book is not a pharmacognosist, but he offers no apology to his colleagues for writing this review. Three decades ago he saw the need of vitalizing the whole field of pharmacy and advocated the introduction of physiology and pharmacology into the group of pharmaceutical sciences in order to accomplish that purpose. That accomplishment one can be sure is being attained when Dr. Theodore Koppányi declares that "Pharmacology is the soul of pharmacy." The reviewer has on many occasions said that pharmacognosy needs vitalizing. He is reminded of this every time he looks over a textbook of pharmacognosy or passes through a pharmacognosy laboratory where students are enjoying an afternoon siesta. When the reviewer finds himself reading this text by Professor Trease for the mere pleasure of experiencing the romance connected with drugs, when he is fascinated by travel through other lands where the commerce in drugs takes him. When by pictures and maps he is taken through the forests and the gardens of the world where drug plants grow and when he finds himself reading the description of a leaf or stem just because of the fascinating way it is told, then he knows he has found a good book even though he knows nothing about pharmacognosy. Professor Trease has begun the vitalization of pharmacognosy and we Americans can well afford to sit on a log by him and catch both inspiration and vision. If Nebraska in general and the University of Nebraska in particular had not been bathed so luxuriously in new deal prosperity, I should make an attempt to induce Professor Trease to change his citizenship and become a Nebraskan.

R. A. LYMAN.

INSTITUTIONS HOLDING MEMBERSHIP IN THE ASSOCIATION

(Continued from Inside Front Cover)

NEBRASKA

Creighton University, College of Pharmacy, Omaha; William A. Jarrett, Dean (1916).

University of Nebraska, College of Pharmacy, Lincoln; Rufus A. Lyman, Dean (1912).

NEW JERSEY

Rutgers University, The State University of New Jersey, New Jersey College of Pharmacy, Newark; Ernest Little, Dean (1923).

NORTH CAROLINA

University of North Carolina, School of Pharmacy, Chapel Hill; J. Grover Beard, Dean (1917).

NORTH DAKOTA

North Dakota Agricultural College, School of Pharmacy, Fargo; William F. Sudro.

OHIO

Ohio Northern University, College of Pharmacy, Ada; Rudolph H. Roake, Dean (1923).

Ohio State University, College of Pharmacy, Columbus; Clair A. Dye, Dean (1900).

Western Reserve University, School of Pharmacy, Cleveland; Edward Spence, Dean (1902).

OKLAHOMA

University of Oklahoma, School of Pharmacy, Norman; David H. R. Johnson, Dean (1905).

OREGON

Oregon State Agricultural College, School of Pharmacy, Corvallis; Adolph Zieff, Dean (1915).

North Pacific College of Oregon, School of Pharmacy, Portland; Antone O. Michelson, Dean (1914).

PENNSYLVANIA

Duquesne University, School of Pharmacy, Pittsburgh; Hugh C. Muldoon, Dean (1927).

Philadelphia College of Pharmacy and Science, Philadelphia; Ivor Griffith, Dean (1900).

Temple University, School of Pharmacy, Philadelphia; H. Evert Kendig, Dean (1928).

University of Pittsburgh, Pittsburgh College of Pharmacy, Pittsburgh; C. Leonard O'Connell, Dean (1900).

PHILIPPINES

University of the Philippines, College of Pharmacy, Manila; Mariano V. del Rosario, Dean (1917).

PUEBLO RICO

University of Puerto Rico, College of Pharmacy, Rio Piedras; Lucas L. Velez, Dean (1926).

RHODE ISLAND

Rhode Island College of Pharmacy and Allied Sciences, Providence; W. Henry Rivard, Dean (1922).

SOUTH CAROLINA

University of South Carolina, School of Pharmacy, Columbia; Emory T. Motley, Dean (1923).

SOUTH DAKOTA

South Dakota State College, Division of Pharmacy, Brookings; Earl R. Series, Dean (1926).

TENNESSEE

University of Tennessee, School of Pharmacy, Memphis; Robert L. Crowe, Dean (1914).

TEXAS

University of Texas, College of Pharmacy, Austin; William F. Gidley, Dean (1926).

VIRGINIA

Medical College of Virginia, School of Pharmacy, Richmond; Wortley F. Edd, Dean (1908).

WASHINGTON

University of Washington, College of Pharmacy, Seattle; Charles W. Johnson, Dean (1905).

State College of Washington, School of Pharmacy, Pullman; F. H. Dirstine, Dean (1912).

WEST VIRGINIA

West Virginia University, College of Pharmacy, Morgantown; J. Lester Hayman, Director (1929).

WISCONSIN

University of Wisconsin, Course in Pharmacy, Madison; Arthur M. Uhl, Director (1900).